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ENGINEERING NEWS-RECORD

NEWS ISSUE — AUGUST 12, 1948

From the rubble of ruined Berlin U.S. Army engineers build new airfiel

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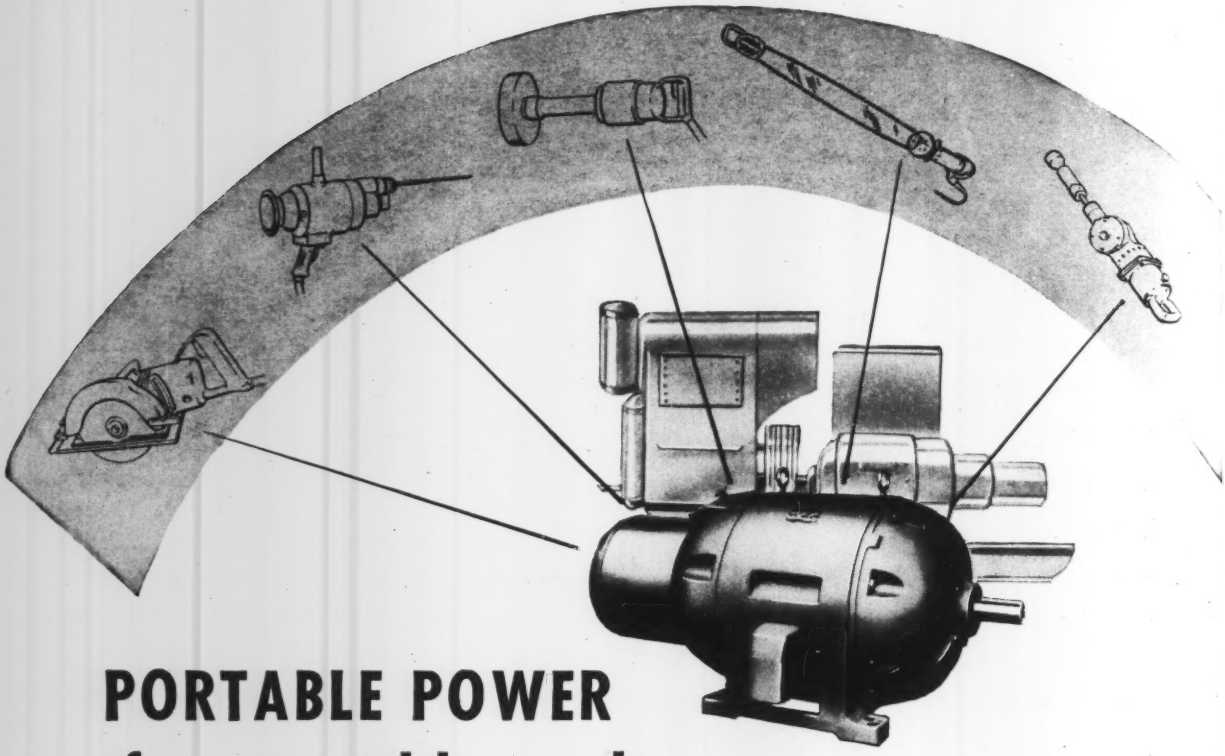

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News of the Week

ENGINEERING NEWS-RECORD • AUGUST 12, 1948 • VOLUME 141 • NUMBER 7

Quadruple power output rise by Reclamation Bureau

Congressional committee investigation reveals plan for $1.4 billion investment in power installations over 10-year period—Transmission line mileage also goes up

The U. S. Bureau of Reclamation, already the largest single producer of electric power in the west, is now planning to quadruple its generating capacity and increase its investment in power equipment nearly tenfold by June 30, 1957.

Almost by accident, details of the bureau's tremendous power construction program were revealed by the Publicity and Propaganda Subcommittee of the House Committee on Executive Expenditures. The subcommittee, headed by Rep. Forest A. Harness, heard of a report prepared by the agency on its 1948-57 program while probing bureau activities. It placed the report, which had been withheld from distribution outside the Interior Department since last April, in the record.

The report indicates total expeditures of $1,416,993,127 for power installations during the 10-year period. This total includes estimates of costs, at 1947 price levels, of strictly power features of reclamation projects—turbines, generators and transmission equipment. No estimate is made on costs of joint power-irrigation facilities, such as storage reservoirs.

Great increase in power

The program, if funds are advanced by Congress, will increase the total generating capacity of plants owned by the bureau and those from which it markets energy from 2,202,400 to 9,595,000 kw. The latter includes generating facilities being installed in the Missouri basin by the Army Engineers.

In addition, the bureau proposes to increase the total mileage of its transmission lines from 2,579 to 22,294. Expenditures for the lines will total $560,761,327, as against a total investment of $856,231,800 in new generating facilities. The bureau's investment in power plant is now reported as $2,202,400.

The bureau expects to start work on power facilities which to complete will cost an additional $393,355,787 after 1957. Of this sum, $187,025,427 will be required to finish power plants and $206,330,360 for transmission lines.

Part of irrigation program

The power developments will be carried on concurrently with the bureau's construction of related irrigation projects, the report points out. No figures have been made available on the proportions of the entire reclamation program for 1948-57, but a breakdown of the agency's expenditures to date indicate that costs of power facilities are about a fifth of total reclamation costs.

The report notes that "national power demand and energy consumption" have increased at "a very rapid rate" and that this trend has affected the west. It also cites the rising cost of coal, oil and natural gas as fuels for the production of electricity. The bureau's power program, it adds, will make "economically feasible" large multiple-purpose developments "greatly needed in the West;" it will supply large quantities of "low-cost power" to shortage-ridden consumers, and it will conserve "none-too-plentiful oil and gas resources."

For agriculture and industry

Besides assisting in relieving definite electricity shortages in certain areas, the power program will encourage development of agriculture and industry, the bureau says. In the Snake River basin in Idaho, for example, additional hydro power is necessary for expansion of mining and mineral processing of that area.

One of the more interesting projects considered is construction of a steam generating plant at Velarde, N. M. This is the smallest of four fuel-burning plants proposed in the report. The others are scheduled for Fresno, Bakersfield and Tracy, all in California. But the Velarde plant is required, the bureau says, to supply additional power to the Atomic Energy Commission's expanding research center at Los Alamos.

Army announces 1949 fund allocation

Details on how the Corps of Engineers will spend the $612,700,000 for its military program in fiscal-year 1949 were announced last week by Secretary of the Army Kenneth C. Royall.

This money was appropriated and authorized during the last session of Congress under three separate accounts: Engineer services, $429,000,000; military construction, $151,000,000; and supplemental construction, $32,700,000.

The $151,000,000 for military construction during fiscal 1949 calls for work in 27 states and 10 overseas areas. A breakdown of this total shows that $65,579,300 is for Army projects, and $85,420,700 for Air Force construction. A breakdown by categories shows that $63,400,000 is earmarked for housing; $64,900,000 will be used for operational facilities, and $22,700,000 for emergency construction. The housing figure is a reduction from the estimated cost of $75,000,000 reported by the Army and Air Force a month ago (*ENR*, July 22, p. 45).

In addition to the above construction funds, a supplemental appropriation of $32,700,000 was made to continue work in Alaska, Guam and Okinawa.

The Corps of Engineers, in addition to its regular military construction for the departments of the Army and Air Force, will continue to execute construction for other government agencies. The assisted agencies furnish the necessary funds for this work.

Because of a Congressional reduction of $30,000,000 in the total $181,000,000 requested for military construction, the Army, the Air Force and the Bureau of the Budget are still working on the distribution of the appropriated and authorized funds.

NEWS BRIEFS

Public Construction—Structural steel is going up for the administration building of the Pan American Union on Constitution Ave., *Washington, D. C.* Builder is Turner Construction Co. . . . Work may start within a year on the $4,000,000 Independence National Historic Park and North Hall at *Philadelphia, Pa.* . . . Federal government is considering construction of a $8,550,000 office building in the proposed civic center, *Minneapolis, Minn.* . . . Architects are starting plans for the $3,000,000 Emmerich Manual Training High School at *Indianapolis, Ind.* . . . On July 19 ground was broken for the $4,810,167 VA hospital at *Marlin, Tex.* . . . Contracts have been awarded for a $5,500,000 public safety building at *Seattle, Wash.*, Spokane votes Sept. 14 on a $3,500,000 bond issue for an auditorium and *Tacoma* may vote in November on a $1,520,000 issue for various improvements. . . . The state has awarded $2,243,804 contracts for a new training school at Southern Illinois Normal University, *Carbondale.*

Industrial Construction—Wisconsin Electric Power Co. is asking public service commission approval of a proposed $13,000,000 addition to its generating plant at *Port Washington, Wis.* . . . . . Excavation has started on the $12,000,000 pulp plant for the H. R. MacMillan Export Co. Ltd. near *Nanaimo, B. C.* . . . Work is starting on the $2,500,000 Statler Hall, at Cornell University, *Ithaca, N. Y.*, the first building for instruction in the hotel field. . . . Chesapeake & Ohio Ry. will spend $9,000,000 on its coal yards at *Russell, Ky.* Ontario Hydro Electric Power Commission announces early development of a 150,000 hp. plant at *Boundary Falls* on the Winnipeg River, and 40,000 hp. each at *Kettle Falls, Oak Falls* and *Manitou Falls* on the English River at a cost of around $50,000,000. . . . Work has started on the $4,000,000 shops structure for the Humble Oil and Refining Co. at *Baytown, Tex.* The H. K. Ferguson Co. is contractor.

Highways—In June the *Pennsylvania* highway department spent $16,837,000—the largest amount for any June in its history. . . . In June and July the *Texas* highway department inaugurated $20,500,000 of new work. . . . *Georgia* highway department will let 18 contracts soon, including the expressway through *Atlanta.* . . . *North Carolina* will spend $45,225,000 on highways in the next fiscal year. . . . Palmer & Baker, Inc., Mobile, Ala., will recommend that *Fort Lauderdale, Fla.*, go ahead with three proposed under-water vehicular tunnels. . . . The State Board of Administration has approved tentatively the proposed $22,500,000 superhighway at *Jacksonville, Fla.*

Housing—RFC has loaned an additional $10,000,000 to the Lustron Corp., *Columbus, Ohio*, manufacturer of steel prefabricated houses. . . . Prudential Insurance Co. has made available more than three quarters of a billion dollars in 1948 for private residential construction. . . . Contracts have been let to Kroening Engineering Corp. for 580 units at *Milwaukee, Wis.* . . . Work is expected to start soon on a 972-unit veterans housing development at *South Boston, Mass.* . . . An $18,000,000 project of 1,800 apartments is being planned in a 10-block slum area on the South Side of *Chicago.* . . . Garden apartments for 104 families will be built at Soundview Ave. and Post Road in *White Plains, N. Y.* . . . Warner West Corp., will build 798 homes in *Upper Darby, Pa.*, to cost $7,000,000. . . . Work is to start at once on a $1,500,000 row housing project in *Buffalo, N. Y.* . . . Globe Const. Co. plans two developments at *New Orleans, La.*, to cost $2,150,000.

Sewers and Water Supply—A sewage treatment plant for $500,000 and water line extension at $600,000 are planned for *North Tonawanda, N. Y.* . . . A $500,000 bond issue is proposed to finance a storm sewer program at *Mansfield, Ohio.* . . . *Orlando, Fla.*, has sold $3,500,000 in sewer revenue bonds to finance a new disposal plant and more sewers. . . . Principal contract at $929,374 has been awarded to C. B. Lauch Const. Co. for the million-dollar sewage disposal system of *Boise, Idaho.* . . . Bids are being opened this month for a million-dollar tunnel to carry storm water from the Lake Merced area of *San Francisco* to the ocean.

CAA announces bids for Alaska engineering

Low bidder on engineering design and inspection service for construction of CAA's International Airport, Fairbanks, Alaska, was Michael Baker, Jr., Inc., Rochester, Pa., $135,000.

Eight bids were received, up to a high of $377,000.

Second low was Thomas B. Bourne Assoc., Inc., Wash., D. C., $188,000.

Flora Engineering Co., Cheyenne, Wyo., which was only $500 high on a bid for Anchorage work (*ENR*, July 29, p. 3) bid $267,500 on the Fairbanks job.

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Okayed compromise housing law omits many features urged by Truman

Congress passes new measure reviving rental housing mortgage insurance under Title VI—provides added incentive for builders

Congress last week ended its desultory special session with passage of a compromise short-term housing bill that restores some lapsed incentives for residential building and adds others.

President Truman indicated he would sign the measure, despite his expected protest against omission of the long-range provisions of the Taft-Ellender-Wagner bill for federal aid to slum clearance and public housing.

Most important immediate effect of the new legislation is revival of rental housing mortgage insurance under Title VI of the National Housing Act. This title died April 30, through failure of Congress to renew it. In the present bill, additional authority is given the Housing and Home Finance Agency to insure $800,000,000 of mortgages until March 31, 1949.

This time the authority applies only to projects built for rent. The mortgage amount is limited to 90 percent of replacement cost of a project, figured on the basis of costs prevailing in the locality on Dec. 31, 1947. A more realistic and flexible cost limitation of $8,100 per dwelling unit replaces the former limit of $1,800 per room.

Restriction of costs to those in effect at the end of last year will act as something of a brake on the admitted inflationary impact of the measure. The bill is expected to draw more construction money into needed rental housing.

Added incentive for rental housing construction is given by authority in Section 207 of Title II for the Federal Housing Administration to guarantee loans for states, municipalities and nonprofit corporations. These mortgages can be for 80 percent—or 90 percent in special cases and 95 percent for veterans' cooperatives—of the value of the completed property. They require a cost limitation of $8,100 per dwelling unit, or $1,800 per room where that is preferable.

Site fabrication pushed

The bill also furnishes assistance to site fabrication, to manufacturers and dealers in prefabricated housing, and to housing research. A builder who sets up on the site a fabricating plant for construction of at least 25 single-family dwellings can get insurance on a mortgage up to 80 percent of completed project value (but not more than $6,000 per dwelling) entitling him to advances from the lender during construction.

As a help to prefabricated housing, Section 609 of Title VI is broadened to include insurance to manufacturers. After making a 20 percent payment, the dealer can get insurance up to 80 percent of the value of prefabricated houses received. Depending on the method of payment, the measure allows 30 to 180 days for the manufacturer to collect from the dealer. The Reconstruction Finance Corporation is authorized to make loans to prefab manufacturers.

The bill establishes a division within the HHFA, for the sole purpose of working toward standardization of building codes and the development of standardized dimensions and methods for assembly of building materials and equipment. Latter provision may add impetus to modular coordination.

Title II—the permanent title—of the National Housing Act is amended to authorize 95 percent buyers' loans on houses costing $6,300 or less. Construction loans of 85 percent are authorized for these houses.

By an amendment contained in the bill, the recently-enacted secondary market for GI home loans and FHA-insured mortgages in the Federal National Mortgage Association is increased from 25 percent to 50 percent. A lending institution, if it wishes, now can sell to this federal secondary market half of its portfolio of such mortgages acquired after April 30, 1948.

Title I Class 3 loans, principally for houses in rural and semi-rural areas, are increased by the bill from $3,000 to $4,500. Additional authorization for insurance of these loans raises the coverage by $35,000,000.

Gen. G. E. Edgerton heads Beach Erosion Board

Maj. Gen. Glen E. Edgerton, former governor of the Panama Canal Department, has been appointed president and resident member of the Corps of Engineers Beach Erosion Board, Washington, D. C., it has been announced by Lieut. Gen. Wheeler, Chief of Engineers.

Assigned to the Panama Canal Zone as engineer of maintenance in 1936, General Edgerton was appointed governor of the Panama Canal Department in July, 1940. He had charge of all defense preparations and operations of the installation throughout the war.

NLRB rules against feather-bedding

The Taft-Hartley Law's ban on feather-bedding has taken its first bite in the construction industry. As ordered on Aug. 8 by the National Labor Relations Board, the Cement Finishers' Local 627 of the AFL Plasterers Union has reimbursed R. H. Parr & Son of Los Angeles for wages the contractor paid four cement finishers who performed no work.

Furthermore, the union is posting the following notice in the union office for 60 days:

"Pursuant to an order of the National Labor Relations Board, you are hereby notified:"

"That we will not cause or attempt to cause an employer to pay or deliver or agree to pay or deliver any money or other thing of value in the nature of an exaction, for services which are not performed or not to be performed."

The second paragraph quoted is the exact language of Section 8 (b) (6) of Taft-Hartley—one of the six unfair labor practices chargeable to unions.

Two aspects of this case are significant: (1) action against the union had to be begun by the contractor and (2) the decision is the result of an agreement with the union.

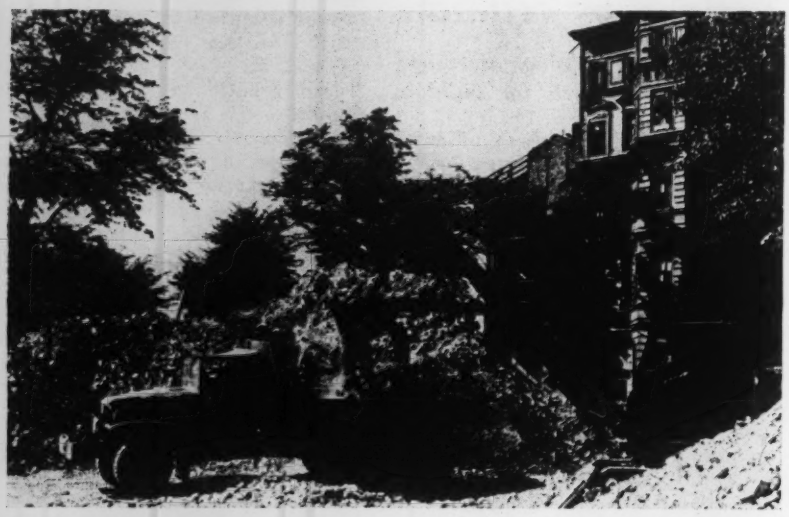
R. H. Parr & Son, general contractors engaged in erecting commercial and manufacturing buildings, filed a charge against the union with NLRB on May 21. Complained the contractor:

He wanted to work two of his four cement finishers overtime to touch up wet spots in concrete laid during the day. The working foreman said none would work unless all of them did. The contractor then had the union send out two other men. They wouldn't work, either, unless all six were paid. With time passing swiftly—and the concrete drying—the contractor gave in. Two men touched up the concrete—about an hour's work—while the others stood by. All six were paid overtime wages.

Six days after the contractor filed the charges of unfair labor practice (feather-bedding), the San Francisco regional office of NLRB issued a formal complaint against the union local.

The National Labor Relations Board has yet to hold its second election among employees in the construction industry in metropolitan Detroit.

FOREIGN DEVELOPMENTS



BERLIN RUINS PUT TO USE—Cleaned bricks from the rubble that was Berlin are used by Army Engineers for a new landing strip at Tempelhof air base. Three 6-in. compacted layers of brick will form a base for the 5,500-ft. pierced steel plank runway, so vital to the air lift that now feeds the city.

Berlin—U. S. Army engineers are rushing construction of a 5,500-ft. pierced-steel plank landing strip at Tempelhof air base, to increase the field's capacity to handle the U. S. share of the great Anglo-American air lift.

Tempelhof has been handling the round-the-clock flights of Frankfurt and Wiesbaden-based C-47 and C-54 transport planes on only one steel plank strip, plus a turf crash strip that can be used by C-47's in dry weather. The record of a single 24-hour period at Tempelhof up to very recently was 305 landings, and the air lift is being steadily expanded both in respect to number of flights and use of larger-type cargo planes.

The new strip, 5,500 ft. long and 140 ft. wide, will have 500 ft. overruns and connecting taxiways to the present plank strip and to existing north and south taxiways.

Since the planking must be flown to Berlin, it has been decided to use aluminum for part of the strip to save weight. Steel will be used up to 1,500 ft. at each end of the runway, thus covering the critical impact and braking areas, and aluminum will be used for the center portion. The required planking will amount to about 2,000 tons, whereas use of steel alone would require flying about 3,000 tons. A further saving will be effected by laying only 120 ft. of the runway width initially.

Ironically the Air Corps is forced to dig into the rubble created in part by its own wartime bombing to make a "brick bat" base for the new strip, since no crushed stone or gravel is available. Huge piles of cleaned bricks, representing thousands of man and woman hours of labor, are readily available within a few blocks of the air base.

About 6,000 cubic yards of bricks will go into the base, which will consist of three 6-in. compacted layers. A one-inch asphalt topping will be applied to the 18-in. bedding.

A handful of Air Corps officers and men are supervising German labor on the project and U. S. Army enlisted men operate most of the equipment. Unfortunately, the Soviet land blockade found the American command in Berlin not well off for bulldozers, graders and other necessary equipment.

Work started July 16. The first 6-in. layer of compacted brick was completed for a distance of 5200 ft. recently, and the second course is well along. Working 'round the clock, it is hoped to have the project completed by Sept. 1.

Industrial development

Africa—Planning is under way for a huge power development in Uganda, Central Africa.

Scheduled for completion in 1953, the initial phase calls for dams at the outlet of Lake Victoria and power units with an output of 524,000,000 kwh. annually. The ultimate electrical output of the Nile as it flows from Lake Victoria to Lake Kyoga and Lake Albert is estimated to be 22,000,000,000 kwh. annually—nearly two-thirds of total electrical production in Great Britain. Between the lakes, the water falls 1,700 ft. in 260 miles.

Saudi Arabia—Construction of the Trans-Arabian Pipe Line will be pushed to completion as rapidly as possible, according to a recent statement by "Tapline" officials. Seventy miles of pipe have been laid and enough is on hand for another 168 miles. Completion of the route requires 832 more miles or 253,913 additional tons of steel. Tapline's application for export license comes up for consideration next month, and pipe will be made available at that time by the Consolidated Western Steel Corp. of Maywood, Calif.

India—U. S. engineering firms are to be retained to supervise the construction of the multi-million dollar Damodar Valley irrigation and hydroelectric project in northeast India.

This would be the second dual-purpose dam project to be turned over to American "know how"—earlier this year it was announced that U. S. firms would be asked to play a major role in the Ramapadasagar dam construction proposed in Madras province.

Industrialization schemes running into hundreds of millions of dollars are now being studied throughout India by technical experts of Koppers Co. of Pittsburgh, Pa. One group will complete a plan for establishment of a state-owned synthetic petroleum industry based on use of low-grade coal. Another group plans to double India's steel output to 2,000,000 long tons annually by building either one or two new plants.

Soil mechanics

Netherlands—Preliminary steps toward the establishment of a permanent international organization devoted to soil mechanics were undertaken at the close of the first post-war international conference which closed here recently.

The meeting, officially titled the Second International Conference on Soil Mechanics and Foundation Engineering, attracted more than 400 delegates from most of the world's nations to hear discussions of latest developments in the science of soils.

The group adopted articles for establishing and governing a permanent world organization that would function during the period between conferences, principally through the issuance of a yearly report on activities and developments. Chairman of the national committees attending the conference were called upon to serve as the nucleus for the international group.

The eight-day conference included daily technical programs, with papers

and discussions of practice and methods presented at two sessions; and a number of field trips that included visits to Holland's famed "polders" (reclaimed lands in the Zuider Zee), and to engineering works in and around Rotterdam.

Arranged under the leadership of Dr. Karl Terzaghi of Harvard University, who acted as president of the conference, and J. P. Van Bruggen and T. K. Huizinga, chairman and secretary of the organization committee, respectively, the meeting produced so many papers that they will require about seven volumes of printed matter in order to be presented in full.

Discussions included: laboratory testing and methods; stability and deformation of artificial fills, such as roads, railway embankments, dikes and dams; slides in natural ground; earth pressure on artificial supports; tunnel and shaft lining; settlement of buildings on footings and mats; pile foundations; improvement of the mechanical properties of the soil through mechanical and chemical means; and ground water observations and drainage.

Copies of the proceedings will be available from Mr. Huizinga, director, Laboratory of Soil Mechanics, Delft, The Netherlands.

The time and place of the next meeting will be set by the international committee.

Among U. S. engineers who attended, in addition to Dr. Terzaghi, were: P. C. Rutledge, chairman of the U. S. National Committee on Soil Mechanics; T. A. Middlebrooks, vice-chairman; representatives of the Corps of Engineers, the U. S. Bureau of Reclamation, the U. S. State Department; and engineers representing many universities, engineering and educational societies.

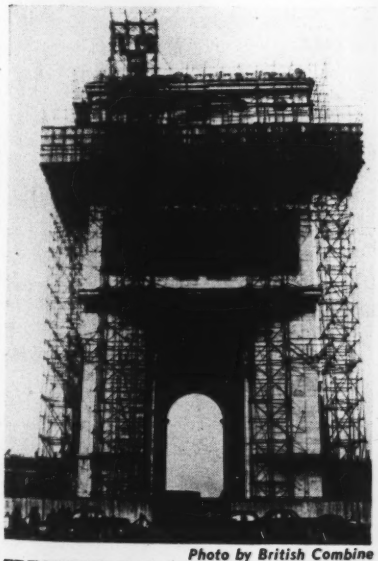
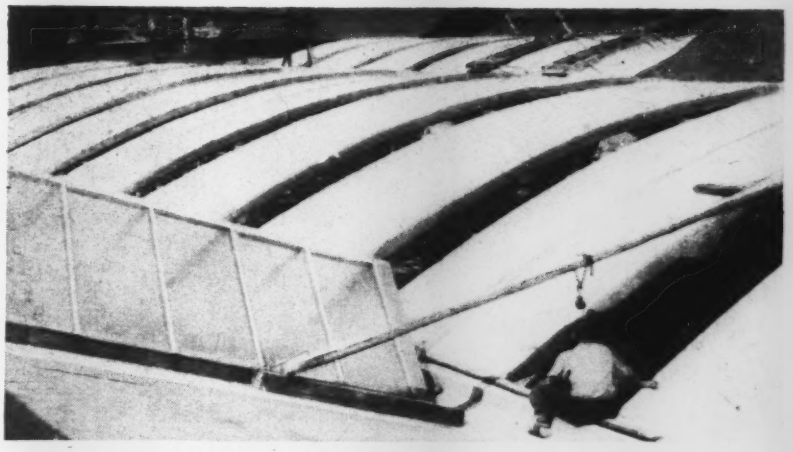


Photo by British Combine

FRESHENING UP—Repairs are nearly completed on damage to the Arc de Triumphe caused during the fighting for the liberation of Paris.



"EGGSHELL" ROOF CONSTRUCTION—Precast concrete arches made up in two parts and assembled on the site are cast by J. Jelinek, Czechoslovakian cement manufacturer. Steamed in the mold for from four to six hours, the 40-meter arches are said to reach 28-day strength in a matter of hours.

Public Works

Liberia—In celebrating its 101st anniversary of independence on July 26, the Republic of Liberia opened its newly-built port and harbor at Monrovia. The port was constructed by the Raymond Concrete Pile Company under direction and supervision of the Bureau of Yards and Docks, Department of the Navy.

Puerto Rico—Public works to be constructed during the current fiscal year involve an investment of $12,000,000. The program includes roads and urban by-pass roads, municipal hospitals and schools.

Transport

Portugal—The Portugese government has voted $10,800,000 to cover 1948 road construction.

Iraq—The Iraq Petroleum Company announced recently in London that it has decided to construct a pipe line from Kirkuk to the eastern Mediterranean seaport. The pipe would have an initial annual capacity of more than 14,000,000 tons of crude oil and its capacity would be more than six times that of present facilities.

The pipe line would be the third line projected for the Middle East, all of which will be built with steel from the United States. Engineers will utilize pipes measuring 30 in. or more in diameter for each of the three lines. Total cost will approach $400,000,000.

Miscellany

Russia—The USSR Academy of Sciences has founded a "wind erosion of sand" laboratory at Ashkhabad for the purpose of developing scientific methods to combat shifting sands of the Kara Kum desert, which jeopardize industries, irrigation canals and railways of the area. The laboratory is said to be equipped with an aerodynamic wind tunnel in which sand storms can be reproduced in miniature.

Siam—Siamese engineers, returning to their homeland after studying irrigation methods for 14 months in America, have as their goal the doubling of that country's rice production in seven years. With the reclamation knowledge gained here, they hope to irrigate 50 percent more land and produce two crops instead of one.

England—Development of Imperial Chemical Industries' new chemical works at Wilton, in the North Riding of Yorkshire, is proceeding well despite the delays due to Britain's shortages of steel and long delivery dates on many items of equipment. Construction of the stores, workshops and boiler plant is well ahead and the first process plants —scheduled to produce "Perspex" transparent acrylic plastic sheet and phenolic moulding powders for the plastics industry—will be in production before the end of the year. Thereafter construction work will be concentrated on a plant to crack petroleum for the manufacture of chemicals. Work is also far advanced on a tunnel under the Tees through which Wilton will supply the Billingham works with certain gases and liquids that come from the cracking plant.

NEW TOWN—Just outside of San Juan, 7,000 flat-roofed concrete homes are built on an assembly-line basis.

Homes in a hurry for Puerto Rico

Part of the badly-housed, crowded population of San Juan, Puerto Rico will soon be occupying the 7,000-home development known as Puerto Nuevo—a city just-outside-a-city that will be complete with churches, schools and shopping areas.

Builder is L. D. Long of Charleston, S. C., who started with land costing about a million dollars, added another million dollars worth of machinery, and is producing reinforced concrete housing on a mass basis. Average cost to the purchaser of the five-room, flat-roofed homes will be $5,000.

Although native materials are being used where possible, it is U. S.-developed production and construction techniques that are making the project economically feasible.

Principal innovation is an aluminum form, four feet long by 22 inches high, which has been designed and patented by Mr. Long. Using an adaptation of the adobe method, a dry-mix concrete is tamped inside the form. As soon as sections of the interior or exterior walls are put in place by this method, the form is removed, and, within two hours, a new section can be cast.

Otherwise, the construction follows conventional U. S. practice, but makes use of a great deal more hand labor than is practicable in the United States—laborers receiving from $2.80 to $3.20 per day depending on skill, and plumbers getting $6 a day.

Houses are being completed at the rate of 50 a day. Ground is cleared for each site, then stakes are driven around a templet. Workmen set up the aluminum forms and plumb them. Then they rapidly complete the 22-in. lift for the five-inch-thick outer wall, and other crews immediately move in to rough in sewer and water pipes.

Immediately after the plumbing crew completes its work, a floor is poured and troweled by hand, and before it has completely set, a mortar topping is troweled into the original mix.

The outer wall is then raised to nine feet above the floor level, and a plywood form is set in place, to form the base for the flat-slab roof. Truck-mounted skip-towers deposit the concrete on the roof-form and, just as with the floor, a mortar topping is added to the mix and troweled. The 4½-in. roof slab sets sufficiently within three days to permit removal of the form.

Inner walls are set through use of the same forms. Finished plumbing and electrical wiring and fixtures are installed by sub-contractors, and the house is then spray-painted as a first coat, hand-painted for a finish coat.

All walls are reinforced to withstand a wind pressure of 150 mph., because of recurrent hurricanes in the area. Side walls are reinforced with ⅜-in. rods, 12 in. on centers, running vertically, and ¼-in. rods 18 in. on centers horizontally. The roof slab is reinforced by welded ¼-in. bar assemblies with bars at 6 in. and 12 in.

Twenty design plans are being followed, but all homes include two bedrooms, dining-living room, kitchen, bath and porch.

QUICK WORK—After walls have been put in place by a tamping method within specially-developed forms, truck-mounted skips deposit concrete atop plywood form for flat-slab roof.

Score Boston transit construction work as mismanaged, politically governed

Non-partisan commission study points out "engineers" who are actually bartenders, salesmen, cafe owners, longshoremen

A scathing report that characterizes a major Boston engineering project as a "haven for political friends and relatives" and calls attention to the classification of bartenders, undertakers, and chauffeurs as engineers, has just been issued by the Boston Finance Commission.

The commission (*ENR* March 11, vol. p. 39) has acted as a watchdog for Boston, Mass., for more than 35 years, using the force of publicity as its chief weapon.

Its report, dated July 21, is one of a continuing series made to keep Boston's civic skirts clean, and to save the city money, time and effort. The commission is a non-political body appointed by the state government, and has the power to investigate the activities of any city department or commission.

Commenting on the current construction of the $8,500,000 rapid transit tunnel extension in East Boston, the commission addressed Mayor James M. Curley with a statement that "It would appear . . . that the transit authorities have been guilty of wanton disregard of the proprieties expected in the management of city affairs. They have grossly abused the latitude allowed in the authorizing legislation.

"Rather than affording an opportunity for the employment of veterans of skill and experience, the project appears to have been used as a haven for political friends and relatives of persons in administrative control," the report continues. "These friends and relatives have been appointed as technicians in fields in which they had no training or experience and they have been allowed rates of pay which only the technically trained and experienced can command."

Investigation difficult

After commenting that officials of the city's transit board made it difficult for the finance commission's investigators who were attempting to match payroll records with assignments, and scoring the "complete lack of control of employees" in the central office and in the field, the commission noted grave flaws in the management of the project.

"Altogether this situation constitutes one of the most flagrantly uneconomical management jobs ever observed by the finance commission," the report said. "Yet this particular $8,500,000 job is only the forerunner to a vast program of expenditure involving $30,000,000 which the 1948 legislature has committed to the Boston Transit Commission."

Of particular interest to engineers was the commission's comment on the enployment of persons supposedly with technical qualifications. The report listed:

"A man originally appointed as a transitman at $2,500 a year, listed in the 1947 police list as a bartender; an assistant engineer, Grade 3, at $2,300 a year, listed in the city directory as a bartender; an assistant engineer, Grade 3, who was found to have been for several years proprietor of a restaurant; a lumber inspector at $2,500 a year, who operated a cafe; a transitman who was listed as proprietor of a grille; a construction foreman at $3.100 a year who was formerly a brewery worker and a chauffeur, and an assistant blueprinter, at $2,700 a year, whose former occupation was an undertaker. Others listed included a rodman who was formerly registrar of veterans graves; a transitman who was very recently a gasoline filling station attendant and manager.

Additionally, a construction foreman, who received $3,100 a year, had been an assistant drawtender at Chelsea North Bridge, and other actual previous occupations for "engineers" were salesman, chauffeur, clerk, musician and laborer.

Similar irregularities were discovered in the employment of "accountants," "cost analysts," "construction foremen." A "personnel director," who received $4,200 a year had been employed for the past few years as "a working foreman-chauffeur."

Commission's conclusions

Commenting that unless the situation is corrected, the transit job appears to be well on its way toward becoming "the most scandalous in history," the report concludes:

"It appears from the above examination of the background of those employed that men with the occupational backgrounds of longshoremen, bartenders, salesmen, blacksmiths, and chauffeurs jumped into ratings of transitmen, cost analysts and construction foremen immediately upon employment, and again, within a space of a few months, became accountants and truck dispatchers, thus displaying a versatility possessed by few mortals."

Pipelines to cost $1 billion await OK

Natural gas pipeline projects certified for construction by the Federal Power Commission are running ahead of last year. During 1947, FPC issued certificates for construction of 1,698 miles of transmission mains; in the first six months of 1948, 3,300 miles were authorized.

Construction of natural gas transmission lines has been booming since the war ended. In the 34½ months from July 1, 1945, to May 15, 1948, the FPC authorized construction of 10,168 miles, according to a recent survey by the Gas Appliance Manufacturers Association.

On May 15, the commission had pending before it applications that call for an additional 13,515 miles of pipeline.

For the 23,683 miles of authorized and pending lines, the total estimation construction cost came to $1,418.000,000, and the total quantity of steel pipe required amounted to 5,480,000 tons.

Included in the 3,300 miles certified for construction during the first six months of this year is one project by the Trans-Continental Pipe Line Co., Longview, Texas, calling for 1,840 miles of pipe, with 15 compressor stations, from the gulf coast area of Texas and Louisiana to New York City. The company estimates the cost at $151,000,000 to $180,000,000. FPC authorization requires start of construction within a year and completion within 28 months after granting of the certificate late in May.

Indicative of the volume of gas pipelines applications handled by the FPC, the commission, in the period July 8-26, authorized construction by three natural gas companies of new pipeline facilities costing $7,000,000. Hearings were started or scheduled for seven proposals involving gas line construction estimated to total $325,000,000. During the same 19 days applications were received for six pipeline additions that total $40,000,000 in estimated cost.

Projects approved for construction included: (1) United Natural Gas Co., Oil City, Pa., 20½ miles of 22¾ in. pipeline, 29 miles of 12¾ in., and 4½ miles of 10- or 12 in., plus, 1,650 hp. of new compressors, $3,057,500; (2) Southern Natural Gas Co., 6½ miles of 24 in. line and 5 miles of 8⅝ in., with 15,000 hp. of new compressor capacity, $3,531,000; (3) Northern Natural Gas Co., Omaha, Neb., 12 ½ miles of 24 in. pile, $500,300.

MUNICIPAL AFFAIRS

GIANT SEWAGE TREATMENT PLANT STARTED—Hydraulic dredge removes sand from site of Los Angeles' Hyperion plant. Part of wall of first digestion tank; bases of other tanks; the 5400-ft. pier for laying outfall pipe; and the new six-mile, 600-ft. wide beach being made from excavated sand, are shown.

The first battery of 18 pre-stressed concrete digestion tanks for the $41,000,000 Hyperion sewage treatment plant for Los Angeles (*ENR* May 29, 1947, vol. p. 874) was poured recently by the Pacific Bridge Co. The plant is designed to eliminate heavy pollution of nearby beaches and waterways.

The tanks are of 110 ft. dia, 35 ft. high and will have concrete-domed covers. Foundations are being placed for an additional battery of six tanks for a final total of 24, set in four rows.

After the wall of each tank is poured, it is wound with high tensile strength wire about 1/6 in. in diameter at 1/2-in. intervals on the outside. Then it is given a coating of gunite about 1 1/2 in. thick. The total thickness of the completed wall is 22 in., with the extra thickness minimizing heat loss. This is the first use of this process in the Los Angeles area.

Three agitators in each tank will keep incoming raw sewage from settling.

Water supply

Bids will be sought soon for construction of a water tunnel in Cincinnati, the first of a series of improvements planned to double the water-service facilities in the city.

Plans and specifications prepared by Black and Veatch, consulting engineers of Kansas City, Mo., call for the installation of a pumping station, booster station, several miles of large diameter mains and two elevated tanks in addition to the tunnel.

The tunnel is to be 13,600 ft. in length and will have a finished diameter of 8 ft. It will be driven through rock and shale at a depth of 140 ft. below ground level. The new tunnel and pumping station will be constructed to parallel and supplement existing facilities.

Meanwhile, adequate financing for construction of the proposed 150-mgd. Nottingham water filtration plant in Cleveland has been assured by the recent sale of $12,000,000 worth of first mortgage revenue bonds. Construction items for the new plant will include $5,200,000 for filters, administration and chemical building; $2,300,000 for mixing, flocculating and settling basins; and $3,150,000 for pumping station, machine shop and garage.

Halsey, Stuart & Co., and Otis & Co., both of Cleveland, purchased the entire bond issue. The bonds carry maturity dates ranging from 5 to 25 years and will bear an average interest rate of 2.2369 percent.

This was the second of three groups of bonds, aggregating $27,000,000, to be sold by the city for enlargement, improvement and expansion of its water system.

A previous bond issue, for $8,000,000 was sold last April to cover the construction of a large water main under Chester Ave. and for construction of the Nottingham intake. This intake, now under construction, includes a crib submerged 50 ft. in Lake Erie. 3 1/2-mi. of 10-ft. dia. concrete pipe laid in the bed of the lake connecting intake and a shore shaft, and 1 1/2-mi. of land tunnel connecting the shore shaft and the proposed filtration plant. Completion of the entire plant is scheduled for 1951.

Other water supply developments during the week included:

A $536,320 water system expansion program for Albuquerque, N. M., to prevent recurrence of water shortages which occurred this summer and a year ago, as well as to provide for continued growth of the city, has been recommended by the Lubbock, Tex., engineering firm of Hasie and Green.

The firm is now engaged in preparation of a "master plan" for a 10-year expansion of Albuquerque's municipally-owned water system.

The 15-point program includes six new wells—three of them recommended for immediate construction—four additional booster pumps and miles of new 12 to 22-in. mains. There is an adequate supply of underground water at Albuquerque but new wells must be drilled farther apart than present ones to take full advantage of the supply, engineers have advised the city.

Norwich, N. Y., bought the Norwich Water Works from the New York Water Service Corp. for $600,000; and several Florida communities including Jennings, Lake Placid Ocoee, Bronson and Copeland, have been advised to boil drinking water because of the danger of pollution, according to J. B. Miller, a state board of health engineer.

Parking plans

Wilmington, Del., merchants have formed Shoppers Parking, Inc., to finance the erection of a large parking center at Seventh and French Streets in mid-city.

A committee, which spent six months developing the present project, reported that the present trend toward decentralization of the downtown commercial district can be halted by providing off-street parking facilities. More than 20 percent of the capital sought for the parking center has been pledged.

A "fringe parking" plan that will take 7,250 automobiles off Boston's streets daily and cut down the Metropolitan Transit Authority's deficit by $670,000 by providing parking space either free or at a nominal fee, has been approved by Mayor James M. Curley. The city law department has been directed to draw up the necessary petition to the Massachusetts Legislature, asking that the land be taken by condemnation and turned over to the Boston Transit Commission for lease to the transit authority. A similar plan is being pro-

posed for Washington, D. C., where motorists are to be given tickets if they leave their cars in metering spaces longer than one hour.

Among cities which have recently installed parking meters or extended their use are Akron, Canton, Galion, Tiffin and Bowling Green, Ohio; and Noblesville, Goshen and Richmond, Ind.

The city council of Ann Arbor, Mich., has authorized a $300,000 bond issue to provide a three-level municipal parking garage two blocks from the business district. The proposed building continues the city's plan to use revenue from parking meters to provide parking space throughout the city.

A parking station project at E. Wells St. and N. Broadway, Milwaukee, Wis., will be the first such project to be financed by the $2,000,000 bond issue voted last April for parking facilities.

Sewer projects

City Manager Windom of St. Petersburg, Fla., is experimenting with aerial mapping of the city in a program to determine the number of homes now without sanitary sewer services and thus estimate the revenue to be expected under the city's proposed plan.

Dallas, Tex., is letting about $1,200,000 of contracts for the construction of the big White Rock sanitary sewer to extend five miles from the Trinity River, South Dallas, to Ash Creek, just below White Rock lake.

Arkansas state health department has approved a $1,000,000 sanitary sewer interceptor system to serve areas along the Arkansas River.

Virginia Tech's new $364,000 sewage disposal plant, designed and supervised by civil engineering students, is now in operation at Blacksburg, Va.

Expansion of the sewage disposal plant of Denver, Colo., through a $1,750,000 bond issue is said by Mayor Newton to be absolutely necessary, on the basis of engineering reports.

New Philadelphia bridge?

Construction of a new bridge linking South Philadelphia and New Jersey is being recommended to the Delaware River Joint Commission. Theodore T. Knappen, president of the Knappen Engineering Co. which is making a survey of port requirements for the commission and the states of Pennsylvania and New Jersey disclosed the recommendation.

He said that the new six-lane bridge, to cost about $43,000,000, would span the river between Packer Ave. in Philadelphia and Gloucester, N. J. At the Philadelphia end of the bridge there would be a clover-leaf arrangement of entrances into Oregon and Delaware Aves., and at the New Jersey end access would be provided to Crescent and Jackson boulevards and the new Fairway leading to Camden.

Tolls of between 25 and 30 cents would make the bridge self-liquidating, Knappen asserted. He added that his firm also favored the construction of a $33,000,000 super-marine terminal at Greenwich Point, almost directly below the Packer Ave. bridge approach.

(Wide World Photo)

BROOKLYN-MANHATTAN TUNNEL—Vehicular link from Battery Park to Brooklyn, now 70 percent completed and due to open for traffic in 1950, will cost $77,000,000, exclusive of real estate. Fresh air will be blown into the tunnel from under the floor shown in foreground at left. At right, men work on emergency cross passage between the two tubes of the tunnel.

Harbor jobs planned

The common council of Buffalo, N. Y., has cleared the way for the start of an extensive harbor-improvement program by unanimously approving a resolution assuring the federal government of the city's cooperation in the project, which is estimated to cost $10,000,000.

Actual digging on $16,000,000 upper river harbor of Minneapolis, Minn., can start Sept 1, Army engineers say, but it will be at least 1953 before completion of the 9-ft. channel, two dams and locks, and bridge alterations that are planned to bring large boat traffic into the north Minneapolis industrial and warehousing section all the way up to Forty-Second Avenue North.

Airport work

The Philadelphia city council has authorized Thomas Buckley, public works director, to enter into contracts for the first stage in a $10,000,000 improvement and expansion program for the Philadelphia International Airport.

Mr. Buckley said the work includes "must" items, designed to provide an adequate and creditable air terminal at the field, formerly known as Southwest Airport.

First in the improvement plan will be the construction of a $4,000,000 air terminals building and ramps. This will replace the present small structure which has proven inadequate to handle the volume of traffic now using the airport.

Other items call for extension of instrument runways from 5,300 to 7,300 feet, installation of new taxiways, aprons, drainage facilities, access roads and electrical equipment, including sealed control devices. The program also calls for the acquisition of 800 acres of new lands for extension of the field.

Municipal Shorts

A $2,750,000 memorial auditorium is to be built at Erie, Pa. . . . Batavia, N. Y., is considering a long range street and highway development plan to include widening of arterial routes. . . . At Buffalo, N. Y., all low bids for construction of the city's incinerator project have been withdrawn by the contractors in view of rising costs. . . . Construction is about to start on a 1,000-car garage astride the Manhattan approach to the Brooklyn-Battery tunnel. It will be built and operated by the Triborough Bridge and Tunnel Authority. . . . Montreal has voted $2,000,000 for an extensive street widening plan. . . . The Municipal Research Bureau recently reported that Boston is now obligated for $75,000,000 in construction projects, most of it to be paid by local property taxes. . . . Portland, Me., is taking steps to abate the smoke nuisance in that city. . . . Using funds now available, Dayton, Ohio, will start its 10-year capital improvement program, with new bridges scheduled to get priority. . . . Progress is being made on more than a million dollars worth of civic improvements in Ardmore, Okla. according to latest reports to the city government.

Business men to confer on city traffic tangles

More than 600 business leaders, city officials, members of city planning commissions and parking authorities, and representatives of automotive, transit, trucking and other industries interested in community problems will attend the Businessmen's Conference on Urban Problems, to be held in Detroit, Sept. 13 and 14.

The meeting has been called by the Chamber of Commerce of the United States, under direction of its Construction-Civic Development and Transportation-Communication departments, and in cooperation with the Detroit Board of Commerce. The sessions will be held in the Hotel Statler.

As a prelude to the discussions, the Detroit Board of Commerce and the Detroit City Plan Commission will conduct a bus tour of the city on Sunday afternoon, Sept. 12. The route will include points of special interest, with an explanation to be provided as to their relationship to future city development plans.

Baltimore-Harrisburg pike to get under way next year

E. L. Schmidt, chief engineer of the Pennsylvania State Highways Department, reports the department has prepared to start construction of the Pennsylvania section of the proposed Harrisburg-Baltimore pike next year. Plans call for it to be a four-lane divided highway.

The project is contingent on the 1949 Pennsylvania General Assembly setting aside funds for the multi-million dollar pike. The department is looking to the next session of the legislature to provide the necessary funds.

Engineering surveys already are under way on the Pennsylvania section to replace the present winding hilly road running from Harrisburg through York to the Maryland line.

Governor Lane of Maryland and Governor Duff of Pennslyvania conferred on this and other bi-state projects at a meeting held at Harrisburg on July 24. Under the joint state plans, the present highway, known as the York Road will be replaced with a limited access expressway, cutting intersections at grade to a minimum.

Governor Lane said that the first Maryland work will start at Timonium, Md., and proceed northward to the Pennsylvania state line. Plans for the southern section—from Timonium to Baltimore—are being held up pending settlement of the exact route the road will take in entering Baltimore.

Plan $3 million approach to Easton, Pa., bridge

Easton, Pa. has approved plans for the $3,000,000 approach to the Bushkill Street toll bridge across the Delaware River and has given the Delaware River Joint Toll Bridge Commission the right to take over any city streets it may require.

The Bridge Commission plans to start construction next March 1, with June 30, 1950, as the completion date. Buildings in Easton worth nearly $1,000,000 will be demolished to make room for the high-speed throughway.

The 2,300-ft. approach, extending three and a half blocks from Pearl and Bushkill streets to the bridge proper, will be four lanes in width. An elaborate interchange will allow through and local traffic to merge at the eastern terminus of the approach.

Extensive construction at Corpus Christi, Tex.

Corpus Christi, Tex., a city of about 70,000 population, is experiencing a building boom of considerable proportions. It is estimated that about $32,000,000 is being expended there in industrial, commercial and residential construction.

The largest project is the $18,000,000 plant of the Corn Products Refining Co. on which 1,600 men are currently engaged.

A $3,000,000 high school, a $900,000 J. C. Penney store, a $700,000 telephone building addition, and new homes at the rate of 200 a month are other items in the city's big building program.

Texas counts $100 million road work under way

The Texas Highway Department will take bids on nearly $2,900,000 worth of work Aug. 24-25. This will raise its total amount of work under contract to $100,000,000.

The August letting will be smaller than those of recent months, which have averaged over $7,000,000. The June-July list set a record of $20,500,000.

Department officials expect the present downtrend will continue until the new federal aid funds are available next year. Texas expects to continue its present rate of farm to market road-building. The August list includes 186 miles of rural road estimated to cost $1,616,000 and 47 miles of primary highways estimated at $1,273,000.

Free bridge across Rio Grande

Texas Highway Commission has ordered the start of negotiations for a toll-free bridge across the Rio Grande at Del Rio. This was indorsed by civic groups over a wide area of West Texas. Such a bridge would stimulate trade between Texas and Mexico according to the thinking of the Commission.

Chesapeake Bay bridge financing up soon

In September $36,000,000 in bonds for the construction of the Chesapeake Bay bridge will be offered to the public and contracts will be let soon thereafter, it was announced following a meeting between the Maryland State Roads Comission, the Highway Advisory Council and Gov. W. Preston Lane of Maryland.

Squirrel Hill Tunnel contract awarded

The Pennsylvania Department of Highways Aug. 4 received approval by the Federal Bureau of Public Roads and awarded a $13,768,000 contract for construction of the Squirrel Hill Tunnel in Pittsburgh to B. Perini & Sons, Inc., of Framingham, Mass. The second bid for the tunnel—a section of the Penn-Lincoln Parkway—was submitted by the Hunkin Conkey Co. of Cleveland, Ohio.

Bids for the project were originally received in March and two contractors submitted proposals, the lower of which was from the Hunkin Conkey Construction Co., at $17,824,147. This bid was rejected by the department as excessive and plans were revised to eliminate some of the items which could not be gotten under way until after the tunnels were bored.

The project now includes all of the work except the tile lining for the twin tubes, the brick road surface in the tubes, construction of the ventilating building above the electrical floor, and the paving of the needed approaches.

The contractor has two years in which to build these tunnels and when construction of the tunnels has reached a point when it is considered feasible to go ahead, additional bids will be asked by the department for the items eliminated when the plans were revised.

Work covered in the project includes 247,450 cu. yd. of excavation for the rock tunnel and 89,904 cu. yd. of other excavation. The twin tubes will require 7,761,000 lb. of steel for the permanent tunnel supports, 5,273,000 lb. of steel bars and 88,560 cu. yd. of concrete.

7 A.M. The old bridge supports the new as crane and locomotive drag shop-built, 162 ft. bridge into place at Sheboygan. Four-point skidding did not damage existing rails. Note hoisting plate shackle for wrecker hook at end cross beam of new bridge; also staging prepared to receive old truss.

Place long railroad bridge in 9 hours

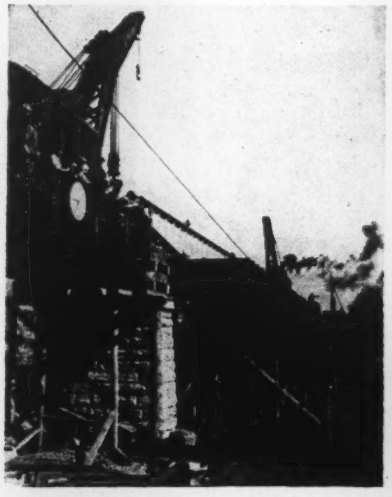
At 5 o'clock on a recent Friday morning the Chicago and the Northwestern Railway began to detour trains around the company's Sheboygan River Crossing, at Sheboygan, Wis. Nine hours later, at 2 p.m., a brand new bridge on the existing foundations was ready for traffic, and at 2:30 the Shoreland "400" Streamliner crossed the structure on its way to Green Bay.

The 162-ft. single track deck span is made up of two 7½-ft.-deep plate girders 7 ft. apart. It is fixed at the center on the pivot pier of the structure, which once had been a swing bridge. Though there is no need for a movable span at present, the new superstructure is built for conversion to swing use.

The longest completely shop-riveted span ever to be shipped from the American Bridge Company's Gary, Ind. plant, the new bridge weighs 140 tons, and required five cars for shipment. Cars 2 and 4 were heavy-duty, 200-ton capacity flat cars, and cars 1, 3 and 5 were standard cars acting as idlers.

In preparation for replacement, Timber piles were driven, capped transversely, and braced both ways to form a falsework deck below and to one side of the bridge position. Meanwhile two wreckers moved the new span from cars to a position alongside the main track, a short distance north of the crossing. Two transverse oak bolsters, which had transmitted the span load to the carrying flat cars, were left in place and shod with 24-in. I-beams laid on their sides. The downstanding I-beam flanges were notched to the web, at standard gage spacing, so that the assembly could be dragged on rails without danger of sideslip. When the new bridge was placed on the main line, full 24-in. I-beam web depth bearing was obtained at the four support points.

The operation after dragging began is shown in the accompanying photographs. E. C. Vandenburgh is chief engineer of the C. & N. W. Ry. J. D. Datesman, A. H. Deno and R. Henkey ran the job in the field—A. R. Harris, *engineer of bridges, C. & N. W. Ry.*



8:35 A.M. Wreckers hold the new bridge aloft while the old bridge, jacked up on rollers, is moved aside. Above the spectators is seen one of two towlines. These lines ran from the truss through sheaves on the false-work to locomotives on the bridge approaches. The old turntable equipment was left attached to the truss.

12 NOON. Workmen place new ties on the bridge. Rails from the old bridge then were re-laid on the new. The steel center tower had been assembled on the low staging, adjacent to the center pier, and moved into place before the plate girder assembly was lowered.

MEN AND JOBS

Saul S. Ganick, special assistant to the New England division engineer of the Corps of Engineers, is joining the J. Slotnik Co. organization of Boston, Mass., builders. Mr. Ganick recently returned from a two months special assignment in the Pacific Northwest, where he assisted in the preparation of the Corps of Engineers' Columbia River report. He has been with the Army Engineers for 13 years in various capacities.

S. P. Carman, consulting engineer of Binghamton, N. Y., and a former superintendent-engineer of the municipal water bureau, has been appointed chairman of the newly formed Binghamton Parking Authority.

V. Harry Rhodes has been named to succeed the late **Joseph P. Sullivan** as building commissioner for the St. Louis, Mo., public schools by the Board of Education.

William J. Shaw, division engineer of the Canadian Division, New York Central Railroad, at St. Thomas, Ont., has retired, ending an engineering career of 47 years.

Charles E. Hammell has resigned as maintenance adviser of the Ohio River Division Corps of Engineers. He has served with the division for 41 years and has assisted in the construction and maintenance of 132 locks and dams on the Ohio River and its tributaries.

Clayton L. Piper, (left) former commissioner of engineering and construction for Toledo, Ohio, has been appointed to the newly-created post of aviation commissioner, and Arnold V. Finch has been named to succeed him. Mr. Piper will direct development of a new Class IV airport, and direct the present airport. Mr. Finch will direct the street improvement program and other work.

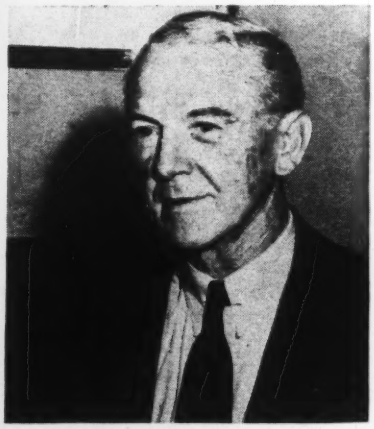
Ernest Fortier (right), USBR engineer, explains the itinerary of a California ASCE convention field trip to R. E. Dougherty (left), ASCE president, and J. W. Cunningham, ASCE vice-president. The trip covered Friant Dam, Friant-Kern canal, and Pine Flat Dam.

Executive Secretary L. V. Hanson of the State Aeronautics Commission of South Dakota has announced the appointment of **James H. Hunt,** Rapid City, as airport engineer to succeed **L. D. Howard,** who resigned to enter private business. A student at the state school of mines from 1934 to 1936, Hunt was employed by the state highway department for two and one-half years and as an engineer by a commercial concern for four years. He served 42 months with the Army Air Forces during the war and recently obtained his degree as a civil engineer from South Dakota School of Mines.

Harry Robert and **A. G. Stanford,** of the engineering firm of Robert and Company, of Atlanta, Ga., have been employed by the North Carolina State Ports Authority to study port facilities at Wilmington and Morehead City, N. C., and make recommendations concerning future needs and developments.

Harry Selfridge and **R. W. Beachley** of West Jefferson, N. C., have formed Carolina Engineers, Inc., a general engineering firm.

Jack E. Harns, for the last five years engineer-in-charge of operation and maintenance of the St. Marys Falls Canal and Locks at Sault Ste. Marie, Mich., has been made resident engineer in charge of constructing the Corps of Engineers' $20 million Mt. Morris Dam and flood control project, near Mt.



William D. Wrightson of Chevy Chase, Md., has been named engineering assistant to the newly-formed office of Civil Defense Planning which is charged with developing plans for civil defense in the United States, and the program of legislation looking towards the establishment of a permanent agency capable of expansion in case of an emergency. Mr. Wrightson will have to do with sanitary engineering matters especially.

Morris, N. Y. At the same time, **Clifford A. Aune,** assistant engineer-in-charge at the Soo for the last four years, was promoted to engineer-in-charge, according to Col. A. Riana, district engineer, Detroit District.

Mr. Harns was graduated in civil engineering from Purdue University in 1925, and immediately entered the Corps of Engineers. His first assignment was surveyman on the Ohio River Dam 53 near Cairo, Ill. During the last 20 years he has engaged in a wide variety of design and construction with the Corps of Engineers such as engineer in charge of design, Upper Mississippi Valley Division Office; in charge of all construction on the Passamaquoddy Tide Power project; area engineer on the Wykill River project; in charge of design and later, construction of the Wappapello Flood Control project, Memphis, Tenn.; and during 1942 he was in charge of constructing the MacArthur Lock.

Mr. Aune is a civil engineering graduate of the University of Wisconsin and has been with the Corps of Engineers for the last 19 years. In 1939 he was designated chief of the design section, Detroit District, and supervised the design of such major construction projects at the Soo as the new Brady Pier, the Southeast Pier, the Southwest Pier and the new mooring basin.

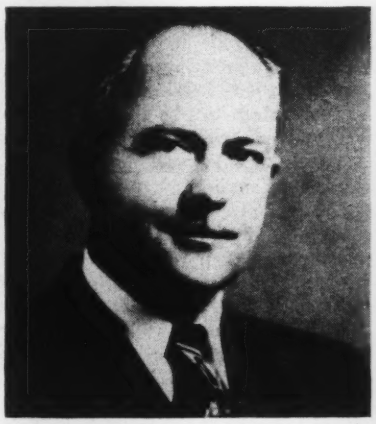
W. S. FitzSimons, Jr., who served as Federal Housing Administration inspector at Charlston, S. C., in 1941 and during the war as an ordnance major, has been named assistant city building inspector at Winston-Salem, N. C. Formerly he was employed with Trott and Chapman, Greenville, S. C., architects and engineers; Simons-Mayrant Co. of Charleston, engineers and contractors; and the Dotterer Engineering Co. of Charleston. Since the war he has been taking postgraduate work in engineering at Clemson College.

Maj. R. M. Whitenton, who has been attending school the past year at the California Institute of Technology, was assigned to the Tulsa District Corps of Engineers recently.

Spencer Miller, Jr., of South Orange, N. J., has been renamed state highway commissioner on a temporary basis by New Jersey **Governor Driscoll.** Though his term expired in April, he will continue until a new appointment is made.

Charles E. Remington, who has been in charge of the roads and trails section of the northern region division of engineering at Missoula, Mont. has been transferred to the division of engineering in the Washington, D. C., office of the U. S. Forest Service. A 1929 civil engineering graduate of Oregon State College, he was with the Idaho highway department before joining the Forest Service in 1935. He has been replaced by **H. T. Holmquist,** civil engineer from the Forest Service's Washington office, division of engineering.

Stanley G. Greene, assistant division engineer in Kansas City for the Public Buildings Administration, has been advanced to the division engineer's post in Denver. He will have charge of government post office construction and other PBA functions in Colorado, New Mexico, Utah and Wyoming.



A. M. Kuehmsted has been appointed head of the cooling tower division of the Santa Fe Tank & Tower Co. of Los Angeles, Calif. He joined the company in 1936 as an engineer in the cooling equipment division. He was later appointed division manager. During the war, he acted as chief engineer in charge of Santa Fe wood tank production for the armed forces.

Herbert W. Pollock has been appointed Washington state supervisor of hydraulics to succeed Rodney Ryker, now with the Asphalt Institute. A civil engineering graduate of the University of Washington, Mr. Pollock worked in the Seattle engineering department from 1926 to 1930 and in the state department of public works from 1933 to 1935 before becoming Clallam County Engineer at Port Angeles. He entered the Army in 1940. Following his discharge in 1946 with the rank of lieutenant colonel, he engaged in public works engineering with the U. S. Army in Korea until recently.

A sanitary engineer, Norman W. Wagner, now supervises operation of the Stamford, Conn., sewage-treatment plant and incinerator, a project on which he worked as a designer and resident engineer for Keis and Holroyd, consulting engineers, Troy, N. Y.

With heavy equipment moving in daily at the Hungry Horse project in Northwest Montana, C. H. Spencer (left), construction engineer for the Bureau of Reclamation, and R. J. Newell of Boise, director of Region One, discuss the plans of the contractors, General - Shea - Morrison of Seattle, Wash. The dam is to be a concrete arch structure more than 520 ft. high with a crest length of 21,000 ft. and will create a reservoir to impound 3,500,000 acre-feet of water. Four 75,000-kva units are to be installed in the power plant.

PERSPECTIVE . . . .

Defense Homes Corporation closes shop

The Defense Homes Corporation, created in 1940 to provide housing for defense workers, ended its active operations on July 30 showing a profit of about $2,100,000, it has been announced by John Taylor Egan, Public Housing Commissioner and president of DHC.

The government-owned corporation built and operated 10,964 housing units ranging from individual homes to an apartment hotel. All of this housing has now been disposed of, mainly by sale to private purchasers. The corporation with its capital stock, assets and liabilities was transferred to the Reconstruction Finance Corporation on July 30 for liquidation. Originally established under the RFC, the corporation had operated during the war under the Public Housing Administration. Disposal of its properties was completed on schedule.

DHC was created Oct. 23, 1940, by order of President Roosevelt to provide permanent housing for defense workers in congested defense areas as a supplement to housing provided by private construction.

The projects themselves were scattered in 13 states and the District of Columbia. The locations were selected by direction of the Office of the Defense Housing Coordinator following findings by the President that an urgent need existed in those areas for housing for defense workers.

The 7,234 DHC units in and around the District of Columbia, for example, were built to accommodate workers who went to Washington to take part in the defense activities of the federal government. In other places, the projects were planned for workers at military installations and industrial plants in defense work.

Actual construction of the projects began in 1941. All projects were completed by June, 1944. For the most part, all projects were fully occupied from the time of their completion and had long waiting lists of prospective tenants. Following the end of the war, veterans were given preference for vacancies.

The types of projects varied according to the different needs and localities that were served. In areas of concentrated population, large apartment projects were built such as Fairlington, Naylor Gardens and McLean Gardens in the Washington area. Other DHC apartment developments were in Boulder City, Nev., for employees of the Dow chemical works engaged on government contracts, and the Bureau of Reclamation in Newport News, Va., and Bremerton, Wash., for navy yard personnel. The housing requirements of single Government girls in Washington, D. C., on the other hand, resulted in construction of the Meridian Hill hotel, a large residence hotel complete with lounge and social rooms, a swimming pool, dining room and cafeteria.

Individual houses were developed in 17 projects where that type of accommodation was more desirable and the population was less concentrated. Such projects were built in Sheffield, Ala.; Jacksonville, Fla.; Joliet, Ill.; Boulder City, Nev.; Portsmouth, N. H.; Niagara Falls, N. Y.; Massillon and Columbus, O.; North Charleston, S. C.; Nashville, Tenn.; Corpus Christi and Orange, Tex.; Newport News, Portsmouth, Radford and Falls Church, Va., and Morgantown, W. Va. In all, 2,872 individual houses were built.

New Arkansas levees to cost $2 million

About $2,000,000 will be spent on new levees and revetment work in Phillips County, Ark., by the federal government in the next few months, it was revealed when Memphis district engineers announced that bids will be received for placing about 830,000 cu.yd. of earth at Fair Landing, in the White River Levee District.

This earth will form a new set-back levee made necessary by encroachment of the river on the banks adjacent to the existing main levee.

To build landing strips along Columbia River

Construction of emergency airplane landing strips along the Columbia River will be undertaken by the Oregon State Board of Aeronautics and the Washington State Aeronautics Commission. The first strips will be built near Stevenson on the Washington shore and near Biggs on the Oregon shore.

Emergency landing fields are said to be needed by fliers because of weather conditions in the Columbia gorge, Engineers of the two states will work together in locating the fields.

Materials production up over last year's work

Production of major construction materials—lumber, cement, brick, and selected iron and steel items—increased in May to bring the physical volume of output to the highest point it has reached this year, the Department of Commerce reported last week.

As measured by the department's monthly index of production for selected construction materials, the physical volume of output in May, 1948, exceeded May, 1947, by 3 percent. Similarly, the volume for the first 5 months of this year was about 3 percent ahead of production in the same period of 1947.

Inventories of most materials also improved—as measured by stocks in the hands of manufacturers. Of 33 material and equipment items for which figures are reported, 29 showed larger factory stocks at the end of May 1948 than at the end of May 1947.

These improvements in the materials position acted to support expenditures for new construction, which hit a record level in June of $1,605-million (*ENR*, July 15, p.3).

Engineers' draft plan proposed by NSPE

A three-point program covering drafting of the nation's engineers and engineering students has been proposed to Maj. Gen. Lewis B. Hershey, director of Selective Service by the National Society of Professional Engineers, made up of 18,000 registered engineers in 48 states. The points are:

1. That engineering and science students now enrolled in accredited colleges or universities be allowed to finish their studies for an appropriate degree, provided they maintain satisfactory scholastic standing;

2. That "proper and adequate" procedures be developed to insure a continued flow of new engineering and science students into college classrooms; and

3. That engineers and scientists be fully utilized in essential work in the defense effort.

The engineering group's plan was placed before General Hershey by Paul H. Robbins, executive director. Leading scientists and engineers hold the opinion, the NSPE official said, that selective service should be administered "with full recognition that engineering and scientific skills are indispensable to effective national defense." He cited the danger to the nation of a repetition of World War II's depletion of the ranks of engineers and scientists.

Military bars contract renegotiation

Military construction contracts awarded on a basis of competitive bids under fiscal 1949 appropriations will not be subjected to renegotiation, the Department of Defense decided last week while putting the finishing touches on its excess profits rules.

Authority for contract renegotiation was written into the department's hard goods procurement appropriations bills during the closing hours of the last session of Congress.

The broad and loosely worded authority gave Defense Secretary Forrestal power to call the turn on who would be involved. Basically, Forrestal's procurement specialists are writing a set of rules primarily to fit the aircraft industry and its suppliers of basic components and production tools. The new regulations will be out soon.

You are not renegotiable if:

1. You have a contract for plant or facility construction let under competitive bidding, (exclusive, however, of any machinery or equipment which has or may have a production function in connection with processing an end product).

2. You have a sub-contract under a prime contract or another sub-contract which is exempt.

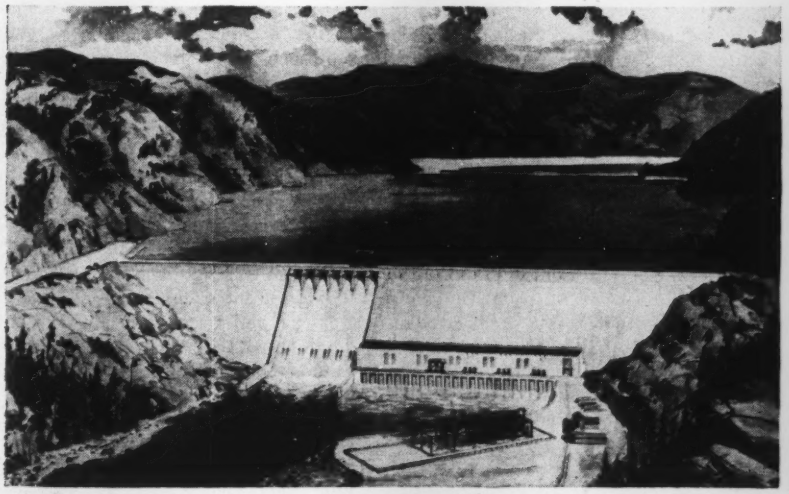
The supplemental National Defense Appropriation Act of 1948, and the Second Deficiency Appropriation Act, which handed the Air Force and the Navy about $5,000,000,000 for plane and aircraft component production, gave Secretary Forrestal the power to make renegotiation applicable to "contracts for ships, aircraft, aircraft parts, and the construction of facilities or installations outside the continental United States, and sub-contracts thereunder," which would be paid for with funds appropriated for fiscal 1949.

The "ships" part of the wording in the law will not be applied to renegotiation, in all probability, because the Navy thinks the Vinson-Trammel Act more directly suited to price control over shipbuilding. This act sets a 10 to 12½ percent ceiling on profit reflected in the selling price of a ship.

Hearing date is set for Kingston-Rhinecliff span

The New York State Bridge Authority has applied to the Corps of Engineers, Department of the Army, for approval of the location and plans of a highway bridge across the Hudson River at Kingston-Rhinecliff, N. Y. A hearing on the application will be held by the acting district engineer, New York District, at the Ulster County courthouse at Kingston on Aug. 31.

The plans submitted show a suspension-type bridge with the center span having a clear horizontal length of 1,650 ft., and two side spans each having a clear horizontal length of 760 ft. The minimum vertical clearance at the abutments is 135 ft. above mean high water and at the towers 143 ft.



MONTANA DAM—Planned to provide a 350-ft. maximum head for hydroelectric power and to impound 4,250,000 acre-ft. of Kootenai River water in northern Montana, Libby Dam would cost an estimated $200,000,000. Proposed as a concrete, gravity type structure, the dam would create a pool extending 89 miles as a narrow strip to a point above the international border.

GARRISON DAM BID REJECTED

Lone bid received by the Army on stage two—excavation and embankment—Garrison Dam near Bismarck, N. D., (ENR, July 22, p 40) has been rejected.

Submitted by Dakota Constructors, a group of contractors, the bid exceeded the engineers' estimate by $23,768,000.

The Army will advertise for new bids on or about Sept. 16, 1948.

To increase power output at Sault Ste. Marie

Awarding of the two main construction contracts in July for the Corps of Engineers' 18,500-kva. hydroelectric power plant at Sault Ste. Marie, Mich., crystallizes plans of long-standing for increasing the power output at the Soo. The new plant, scheduled for completion early in 1951, will replace a 40-year old 5,000-kva. power plant which during the past several years has become increasingly obsolete, inadequate in capacity and expensive to operate and maintain.

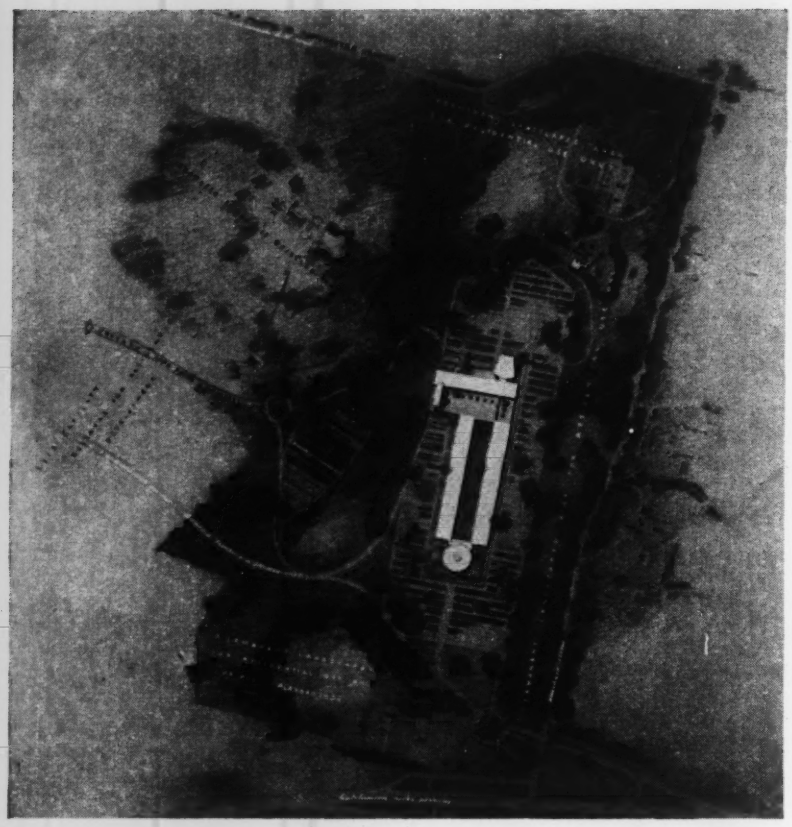
Total cost of the new power plant will be about $6,250,000. Cofferdam construction and power plant excavation is expected to be completed late this year or early next spring, under a million-dollar contract held by the United Construction Co., Winona, Minn.

The successful bidders in the July letting are the Tuller Construction Co., Red Bank, N. J., who offered the low bid of $3,564,700 for construction of the power plant and installation of equipment (*ENR* July 29, p. 7). Dunbar & Sullivan Dredging Co., Detroit, Mich., received a $916,000 contract for constructing rockfill dikes and excavating the raceways.

Health agencies survey Lake Michigan waters

What is believed to be the first intensive survey of the cleanliness and quality of bathing beach waters is now under way on shores of Lake Michigan, the Public Health Service, Federal Security Agency, has announced.

The Tri-State Survey, as it is called, is a cooperative undertaking by a number of state and municipal agencies and the federal government, and will include the lake waters from the northern limits of Milwaukee, Wis., to Michigan City, Ind. The survey is being coordinated by sanitary engineers from the Public Health Service Water and Sanitation Investigation Station at Cincinnati, Ohio.



Sketch of the shopping center at Purchase, N. Y.

The shopping center—logical adjunct of group housing in suburban areas

By T. D. MacGregor

Associated with the great increase in group housing in suburban areas during the last few years has been a mushroom growth of shopping centers outside cities. In view of urban traffic congestion, these centers are a logical development, tending to convert outlying housing projects into independent communities. As a trend and because of the nature of the problems raised, they are of more than usual interest to engineers, city planners, architects and contractors concerned with residential and commercial building.

Special problems in planning a shopping center arise mainly because of their suburban location. Many are connected with the installation of public utilities in such areas, which are often outside the limits of established municipalities—water, sewerage, drainage, lighting, gas, as well as landscaping, paving, sidewalks, playgrounds and parking. Selection of a suitable site, in most cases, is also a difficult question.

It is probable that the commercial center plan in connection with the housing projects started at the vast Parkchester development of the Metropolitan Life Insurance Co. in the Bronx, New York City, ten years ago. At least, that is the prototype for many similar projects elsewhere.

Built in a well-chosen location, a shopping center undoubtedly is of value to adjacent developments. Whether the housewife does her shopping by automobile or on foot, it is a great convenience for her to have a variety of stores close at hand, especially when city traffic can be avoided.

Thus, it is necessary to have ample automobile parking space close by the suburban shopping district. It is also logical to include in the project moving picture theaters, bowling alleys, beauty shops and many other features of modern community life.

How such shopping centers are being planned and constructed in various sections of the country is shown by the illustrations and data herewith concerning a number of typical examples.

Purchase, N. Y.—The Conant Real Estate Trust of Boston, Mass., which is already building a shopping center at Framingham, Mass., where The Jordan Marsh Co. of Boston has the department store space, is planning similar projects in Beverly, Mass., in New Jersey, and in Nassau County, N. Y. It also has an option on 260 acres of estate property at Purchase, N. Y., between White Plains, N. Y., and Greenwich, Conn., and is proposing to build a 60-acre shopping center there in connection with the development of the property as a high-class residential section. The main entrance to the shopping center, which will contain retail shops, restaurants, department store and a theater, would be from the Hutchinson River Parkway. A feature is a nursery for shoppers' children. The core of the project will be two 2-story buildings, each 1,000 ft. long, located at either side of a 150-ft. wide landscaped mall. At the south end of the mall will be the department store in a two-level domed circular structure and at the north end a building for physicians and dentists. Ketchum, Gina & Sharp of New York City are the architects.

Queens, New York City—Benjamin and Harry Nieloss are pushing construction of a $15,000,000 rental garden apartment project and shopping center on an 85-acre tract at Springfield and Horace Harding Boulevards in Bayside, Queens, New York City. The project will contain 1,632 suites, more than 60 stores, garage space for 800 cars, and outdoor parking. Benjamin Braunstein of Jamaica, N. Y., is the architect for the whole project.

Fort Wayne, Ind.—George A. Poag & Associates, a subsidiary of Metropolitan Mortgage Service, Inc., which operates a builders' consulting and planning service in Indiana, Illinois, and Wisconsin, are engineering and planning two community centers in Fort Wayne—Anthony Wayne Village and North Highlands. The former, in the southeast section, will contain 750 family units, single and multiple, and a shopping center with space reserved for a church and a school. The commercial development will consist of retail stores, a tea room, gasoline station, and a moving picture theater.

In the northwest section, is the North Highlands addition. It will contain 250 single-family dwelling units and a shopping center consisting of a supermarket, service station, theater and stores.

Grading and construction will start soon also on a $500,000, 18½-acre business center one-half mile east of Fort Wayne on U. S. Highway 30.

Business enterprises to be located in the center include two restaurants of 200 and 100-seat capacity, bowling alleys, a 100-unit trailer camp with 1,000 sq. ft. allotted to each trailer, with all modern conveniences such as showers, lavatories, laundry facilities and ample parking space. There will also be a modern hotel for tourists and the usual run of community retail stores and services.

Seattle, Wash.—A $12,000,000 shopping center is planned for the Suburban Company in a growing suburban area north of the city, between 1st and 5th Avenues, N.E., East 100th and 105th Streets. The site lies about midway between the two main north-south arterial roads out of the city. The architects are John Graham & Co. No general contract has been awarded yet, but two important tenants have been signed—the Bon Marche, a department store, and the National Bank of Commerce.

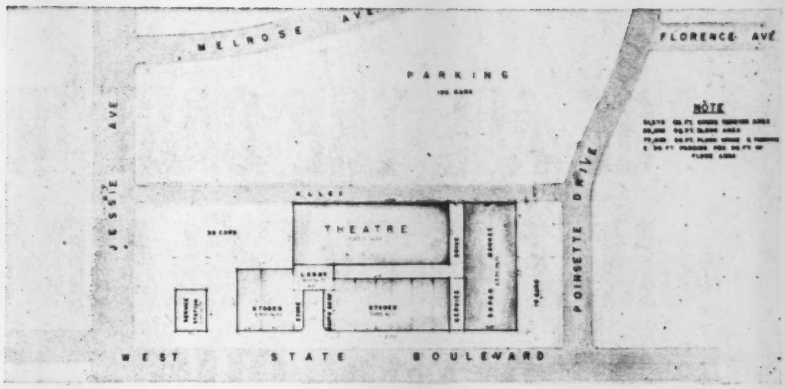
The development, to be known as Northgate, will be a major retail center occupying approximately 66 acres. It will provide parking for 4,000 cars at one time. The Bon Marche (a unit of the Allied Department Stores, as Jordan Marsh is) will erect a department store of approximately 200,000 sq. ft., which will form the hub. The project is designed with the retail stores in the center and the parking adjoining. There will be a central interior shopping street which will be for foot traffic only so that each store will actually have two fronts, one on the parking side, the other on the shopping mall. Underneath the mall is a service concourse which serves all of the stores. In the retail section, there will be approximately 1,000,000 sq. ft. of building. In addition to this, there is planned an amusement section which will comprise bowling alleys, skating rinks, swimming pool, restaurants, etc.

Plans have been announced for a second large shopping center in the suburban area north of Seattle, with William Boeing preparing to build a $5,000,000 project on the Pacific Highway.

Indianapolis, Ind.—Construction has been started on two $1,000,000 business centers by the Foster Engineering Co., Ltd., 4741 East Washington St., Indianapolis, at Thirty-Eighth and Meridian Sts., and at 3762-68 North Meridian St.

The Thirty-Eighth & Meridian center will have a 300-ft. frontage on the south side of Thirty-Eighth St., with a depth of 211.5 ft. east from Meridian St. It will contain 12 stores. The 3762-68 North Meridian St. center has an area of 130 by 80 ft. It will have 4 stores in this space.

All buildings in both locations will be of one-story construction, planned to hold additional floors whenever needed in the future. The stores will have full-vision front windows. Exteriors will be of limestone on concrete. A large parking area will be located at the rear of the Thirty-Eighth St. stores.



Map for North Highlands shopping center, Fort Wayne, Ind.

The Foster Engineering Co., of which C. Wilbur Foster is president, designed the Thirty-Eighth St. building. Joseph O. Cezar, architect, made the plans for the Meridian St. building.

Another shopping center with 30 stores, costing $1,000,000, and providing parking space for 300 cars, will also be built in Indianapolis at the west edge of Meadowbrook, which is a group of 37 apartment buildings being erected on East 38th Street. The center will be known as Meadowbrook Plaza, and will be owned by the Brookfield Corp. There will be a 1,500-seat theater.

Paramus, N. J.—Construction is under way for the nucleus of a new $1,000,000 shopping area at Route 4 and Maywood Avenue, Paramus, Bergen County, J. D. Nassau is the owner. Harold Nixon, Inc., of Hackensack, N. J., is rental and management agent.

The shopping center, which will provide parking off the highway for 1,000 automobiles, will occupy a 16-acre tract. The stores will have 4,700 ft. of highway frontage where 23,000 cars pass daily. It will permit shoppers from adjacent communities to visit a variety of specialty stores and a proposed department store without the necessity of entering the stream of highway traffic.

First of a number of stores in the shopping center will be for the Nassau Furniture Co., of which Sidney Schenker, Paterson, N. J., is the architect.

North Hackensack, N. J.—Another business center, to cost $6,000,000, is planned for this county. It will have a 3,000-ft. frontage on Route 4 at North Hackensack. This highway is the most heavily traveled route in northern New Jersey and the principal artery linking New Jersey and New York via the George Washington bridge over the Hudson River. Parking areas will provide free accommodation for 2,500 cars near the retail units.

The center, on a 50-acre tract, is designed for a large department store, a 2,000-seat cinema and five chain store super-units besides many other stores and offices. There will be a bus station.

The owner-builder is the N. T. Hegeman Co. of New York of which Irving A. Germain is president. Michael M. Barris and Associates, consulting engineers of Englewood, N. J., are in charge of the site development. The architects and designers of the shopping center are Kelly and Gruzen of New York, N. Y., and Jersey City, N. J.

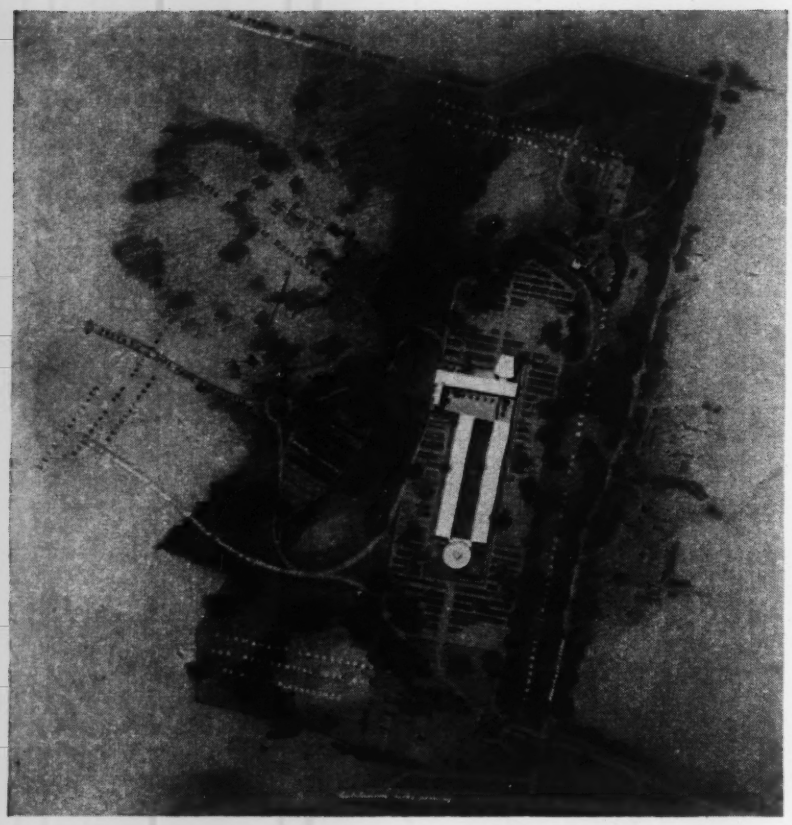
Altogether, about half a dozen new commercial centers are being created in Bergen County.

Yonkers, N. Y.—A shopping center development featuring a John Wanamaker suburban store is to be carried out on a 55-acre tract fronting on Central Park Avenue near the Westchester Cross-county parkway. Midhattan Operating Corp. paid $266,000 for the property. A 14-acre tract has been conveyed to the Wanamaker interests.

Tulsa, Okla.—A shopping center containing 15 stores under a single roof, will be built immediately by the Kennedy family to serve occupants of the Osage Hills rental housing development It will be located between Osage Avenue, Country Club Drive, and Independence and Jasper streets. The center, tentatively estimated to cost $300,000, will be 475 ft. long and 120 ft. wide. Frederick V. Kreshner is the architect.

Tonawanda, N. Y.—Guelich & Boebel, Inc., has plans for a 40-store, $3,000,000 shopping center here.

Port Edwards, Wis.—Work has started on a civic center to replace the present business section of this paper mill village. A 400-ft. long building will house 10 commercial and municipal units, including a bank and village offices.



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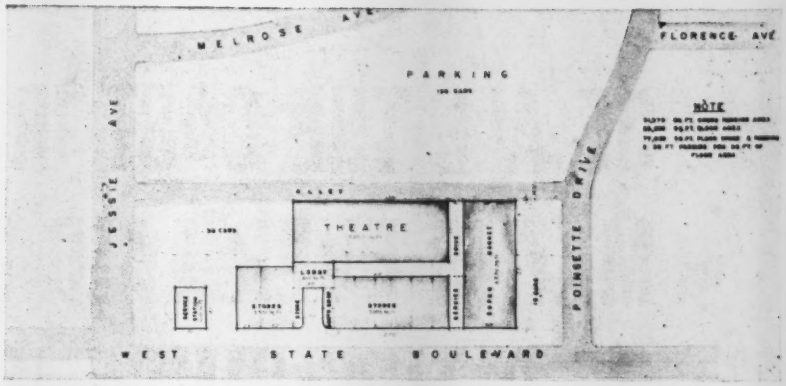

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Hudson River. Parking areas will provide free accommodation for 2,500 cars near the retail units.

The center, on a 50-acre tract, is designed for a large department store, a 2,000-seat cinema and five chain store super-units besides many other stores and offices. There will be a bus station.

The owner-builder is the N. T. Hegeman Co. of New York of which Irving A. Germain is president. Michael M. Barris and Associates, consulting engineers of Englewood, N. J., are in charge of the site development. The architects and designers of the shopping center are Kelly and Gruzen of New York, N. Y., and Jersey City, N. J.

Altogether, about half a dozen new commercial centers are being created in Bergen County.

Yonkers, N. Y.—A shopping center development featuring a John Wanamaker suburban store is to be carried out on a 55-acre tract fronting on Central Park Avenue near the Westchester Cross-county parkway. Midhattan Operating Corp. paid $266,000 for the property. A 14-acre tract has been conveyed to the Wanamaker interests.

Tulsa, Okla.—A shopping center containing 15 stores under a single roof, will be built immediately by the Kennedy family to serve occupants of the Osage Hills rental housing development It will be located between Osage Avenue, Country Club Drive, and Independence and Jasper streets. The center, tentatively estimated to cost $300,000, will be 475 ft. long and 120 ft. wide. Frederick V. Kreshner is the architect.

Tonawanda, N. Y.—Guelich & Boebel, Inc., has plans for a 40-store, $3,000,000 shopping center here.

Port Edwards, Wis.—Work has started on a civic center to replace the present business section of this paper mill village. A 400-ft. long building will house 10 commercial and municipal units, including a bank and village offices.

OF ALL THE CAST IRON WATER MAINS EVER LAID IN THESE 25 CITIES SINCE 1817 IN SIZES 6-INCH AND LARGER

Alexandria, Virginia
Babylon, New York
Clinton, Iowa
Clyde, New York
Denver, Colorado
Des Moines, Iowa
Detroit, Michigan
Huntington, West Virginia
Jamaica, New York
Merrick, New York
Norwich, New York
Ottawa, Ontario
Philadelphia, Pennsylvania
Portland, Maine
Rochester (Suburban), N. Y.
St. Mary's, Pennsylvania
St. Paul, Minnesota
Sag Harbor, New York
Scranton, Pennsylvania
Springfield, Massachusetts
Summit, New Jersey
Syracuse (Suburban), N. Y.
Utica, New York
West Palm Beach, Florida
Winnipeg, Manitoba

Mr. Q-Check says:
Utica, New York, laid its first 6-inch cast iron pipe 99 years ago and 98% of all cast iron pipe of that size ever laid is still in service.

CAST IRON PIPE

96%
ARE
STILL IN SERVICE

We are stating a fact and you don't have to take our word for it. We refer you to one of the most important fact-finding jobs ever undertaken by the water works industry—the recently completed survey of the service life of water works facilities. This survey was sponsored by three water works associations.

The survey shows that *96%* of all the cast iron water mains ever laid by 25 representative cities in sizes 6-inch and larger *are still in service.*

These cities had laid 50 million feet—nearly 9500 miles—of 6-inch and larger cast iron water mains since 1817. They were selected by the Joint Committee, which directed the survey, as representing a cross-section of water service conditions throughout North America.

A detailed report of the survey has recently been published by the American Water Works Association. We have reprinted, by permission, the facts pertaining to cast iron water mains in a brochure which will be sent on request. Write to Cast Iron Pipe Research Association, Thomas F. Wolfe, Engineer, 122 South Michigan Ave., Chicago 3, Ill.

SERVES FOR CENTURIES

ENGINEERING SCHOOLS

Columbia University engineering students to help civic improvements in Connecticut—A program for pre-engineering students offered by North Carolina State College

Two hundred Columbia University engineering students are applying the slide-rule technique to three Connecticut communities this summer. The results will be presented to the communities in the form of detailed reports and specific recommendations for industrial and civic improvement. The students will regard the entire western part of Connecticut as a problem in industrial engineering.

The project will originate from Camp Columbia, summer camp at the University's School of Engineering, at Lakeside, Conn. Dean James K. Finch, says the students will make detailed surveys of the utilities and industrial and civic problems of Thomaston, Litchfield and Torrington, Conn.

Pre-engineering course

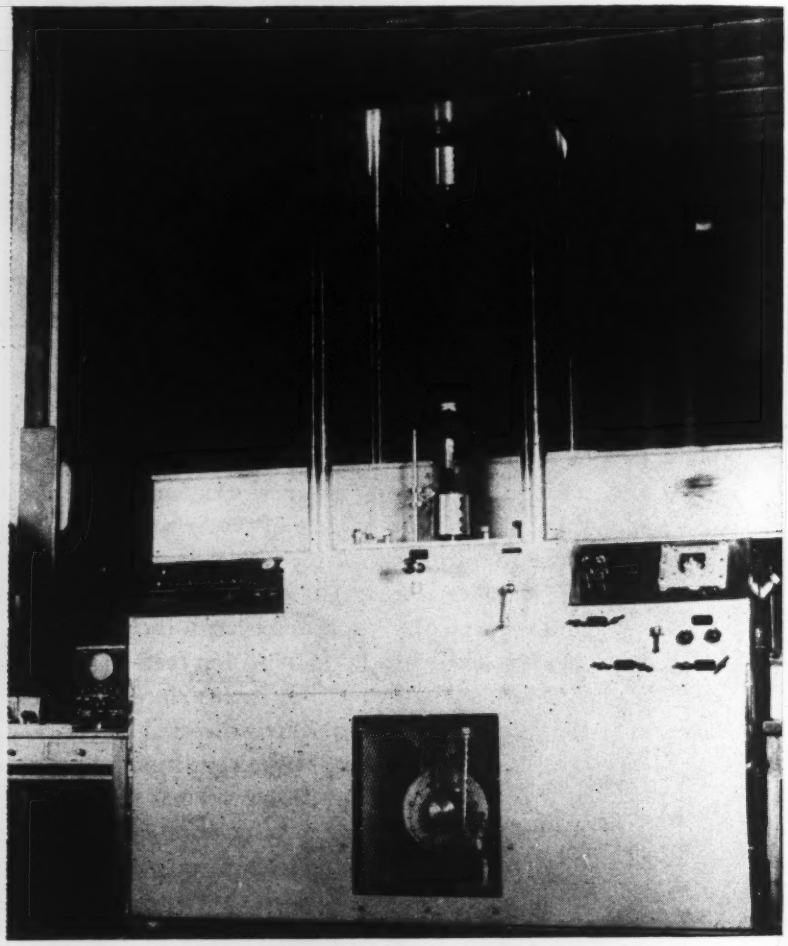
A new educational program for North Carolina high school students in science and mathematics has been announced by the school of engineering of North Carolina State College, Raleigh, N. C. A special six-weeks summer course for high school teachers of mathematics and physics has begun. Dean J. H. Lampe said the course is the result of a study made by the faculty through the North Carolina Chapter of the American Society for Engineering Education. The society's committee outlined the course and will take an active part in its operation. The instruction, sponsored by the school of engineering, will consist of three interrelated courses—engineering mathematics, engineering physics, and an introduction to general engineering.

Study nuclear engineering

More than 70 students have enrolled in the graduate school of nuclear engineering set up at the Atomic Energy Commission's Hanford Works at Richland, Wash., by the General Electric Co., operator of the works, in cooperation with five nearby colleges and universities. F. Ellis Johnson, formerly dean of engineering at the University of Wisconsin, has charge of the program for General Electric. The Universities of Washington, Oregon and Idaho and the State Colleges of Washington and Oregon have agreed to cooperate by granting credits toward degrees for work done. Instructors, like the students, are employees of the Hanford Works. The graduate school is in addition to the program begun last year on the undergraduate level.

Harmer E. Davis, associate professor of engineering at the University of California, Berkeley, has been appointed director of the university's new statewide Institute of Transportation and Traffic Engineering. Prof. Davis, with E. D. Howe, acting dean of the College of Engineering, and John H. Matthewson, who is in charge of the institute's activities on the Los Angeles campus, is now organizing a teaching and research program to be begun this fall.

The John R. W. Davis Memorial Fund has been established at Lehigh University, Bethlehem, Pa., by Mrs. Ethel M. Davis of Seattle, Wash., in memory of her late husband, retired chief engineer of the Great Northern Railroad. Mr. Davis was graduated from Lehigh in 1891. Income from the fund will be used to aid meritorious civil engineering students.



A UNIQUE FATIGUE testing machine has made its debut in the materials testing laboratory, School of Civil Engineering and Engineering Mechanics, Purdue University. Rolland G. Sturm, professor of engineering mechanics, collaborated with Glen N. Krouse of the Krouse Testing Machine Co., Columbus, Ohio, on the specifications and design of the machine. Actually it is two powerful repeated stress machines combined into one machine which has a wide range. In the picture above, a riveted member is under test. SR-4 gages have been attached and the resulting pattern is shown on the oscillograph to the left. The grilled opening in the lower center of the machine shows clearly the variable crank throw which maintains the cyclic rate in high speed (1,000 cycles per minute). The transverse beam on the platform is one of two such beams used when flexural and twisting loads are applied.

OBITUARY

Warren F. Rugg, 70, retired engineer who had worked with the New York City Planning Commission and the Board of Estimate, died at Southampton, N. Y. on Aug. 3. He was a graduate of the Thayer School of Civil Engineering, Dartmouth College, 1902.

Arthur Raymond Holbrook, a civil engineer for the Tennessee Valley Authority, died Aug. 2.

Otto Milburn, 64, road builder and president of the Rockford, Ill., Construction Co., died Aug. 2.

Col. Robert C. Eddy, 67, retired head of the military science department of the Massachusetts Institute of Technology, died at Belmont, Mass., Aug. 2. He was a 1905 graduate of the U. S. Military Academy. After his retirement from the Army he was an associate professor in M.I.T.'s department of business and engineering administration.

John H. Walker, 48, Joliet, Ill., construction engineer, died July 30 in Detroit, Mich. Mr. Walker did much of the engineering work in the construction of the Elwood, Ill., ordnance plant in 1941 and served as its production chief during the war.

John P. Paget, 74, construction engineer, and a native of Harrisburg, Pa., died Aug. 2 in Guayaquil, Ecuador. He went to Ecuador in 1898 to help build the Guayaquil and Quito Railway and had remained there ever since.

Rodney K. Whitt, 46, Columbus, Ohio, government engineer at Fort Hayes, died Aug. 1 following an auto accident in Morganfield, Ky. He was a graduate of Tri-State College of Engineering, Angola, Ind.

Plan to pipe natural gas 1,600 mi. to California

Plans for a 1,600-mi. pipeline to bring up to 400,000,000 cu. ft. of natural gas daily to northern California from fields in Texas and New Mexico have been revealed by Pacific Gas & Electric Co. and the El Paso Natural Gas Co. of Texas. The project will cost more than $145,000,000.

Construction is scheduled to start soon after permits are obtained, with initial operation planned before 1951.

Construction for July hits all-time record

New construction put in place during July hit an all-time monthly peak of $1,724,000,000, John L. Haynes, chief of the construction division of the Department of Commerce, reported last week. The figure was 7 percent above the dollar volume for June.

This July joint estimate of the Commerce and Labor departments brought the value of new construction put in place during the first seven months of the year to $9,400,000,000, 36 percent above the dollar volume for the same months a year ago. If it maintains its present pace, construction put in place during 1948 will meet the recent Commerce-Labor estimate of $18,000,000,000 for the year (*ENR*, Aug. 5, p. 53).

Physical volume of construction has not attained the high level of dollar volume. After adjusting dollar expenditures to allow for cost increases, the physical volume for 1948 comes out less than the years 1942 and 1925-28.

Private residential building continued as the heaviest factor in the construction total for July, accounting for $667,000,000, or nearly 40 percent of the total. It went up $34,000,000 above June and $222,000,000 above July of last year. Lapse of Title VI of the National Housing Act apparently had not affected it much. This title now has been revived for rental housing by the new bill passed by the special session of Congress, as noted elsewhere in these pages.

MAJOR MEETINGS

American Water Works Association, Kentucky-Tennessee Section meeting at Patton Hotel, Chattanooga, Tenn., Aug. 23-25.

Regional Surveying Teachers Conference, Green Engineering Camp, Ringwood, N. J., Aug. 26-28.

National Council of State Boards of Engineering Examiners, annual meeting, Hotel Utah, Salt Lake City, Utah, Aug. 26-28.

American Water Works Association, Minnesota Section at Royal Alexandra Hotel, Winnipeg, Man., Canada, Sept. 1-2.

The International Society for Photogrammetry, Sixth International Photogrammetry Congress and Exhibit, The Hague, Netherlands, Sept. 1-10.

Canadian Good Roads Association, annual convention, at Digby, N. S., Sept. 7-9.

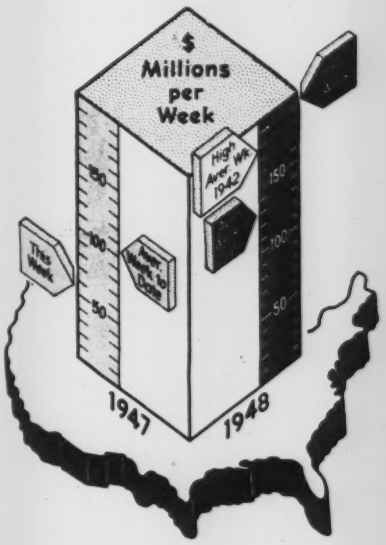
Businessmen's Conference on Urban Problems. Hotel Statler, Detroit, Mich. Sept. 13-14.

Associated General Contractors of America, mid-year meeting of Governing and Advisory Boards, Edgewater Beach Hotel, Chicago, Ill., Sept. 13-15.

Iowa Sewage Works Association, Hotel Kirkwood, Des Moines, Iowa, Sept. 14-15.

Engineer and Architects Association, Hollywood Roosevelt Hotel, Los Angeles, Calif., Sept. 24-26.

CONSTRUCTION ACTIVITY



As Reported this week to . . .
Engineering News-Record

CONTRACT VOLUME

Continental U. S. Only (Thousands of Dollars)

	Week of Aug. 12 1948	Cumulative 1948 (33 wks.)	Cumulative 1947 (33 wks.)
Federal	$38,497	$662,645	$431,201
State & Mun.	87,554	1,616,412	1,065,947
Total Public	$126,051	$2,279,057	$1,497,148
Total Private	68,310	2,115,986	1,868,124
U. S. Total	**$194,361**	**$4,395,043**	**$3,365,272**

WHERE CONSTRUCTION ACTIVITY ORIGINATED THIS WEEK

Dollar Volume (Thousands)

Type of Work	This Week	Cumulative 1948 (33 wks.)	Cumulative 1947 (33 wks.)
Waterworks ...	$3,401	$125,834	$69,784
Sewerage	5,529	138,364	85,051
Bridges	4,282	186,754	109,986
Highways	53,805	666,250	506,449
Earthwork, Waterways	32,402	337,600	196,350
Buildings, Public	15,061	685,342	358,453
Industrial ...	32,613	625,611	501,743
Commercial .	25,766	1,219,009	1,098,415
Unclassified ...	21,502	412,279	439,041

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1948 (33 wks.)	Cumulative 1947 (33 wks.)
NON-FEDERAL	$3,214,383	$1,504,622
Corporate Securities	1,638,923	522,299
State and Municipal	1,148,171	734,612
Fed. Aid Highway.	427,289	247,711
FEDERAL	1,558,932	818,729
Total Capital	**$4,773,315**	**$2,323,351**

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost..	Aug. '48	475.51	228.58
Building Cost.	Aug. '48	355.45	192.15
Volume	July '48	213.	93.

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager — J. A. MAHONEY, Reports — E. R. BIGGERSTAFF, M. R. ROESSLER, Statistics

WATER SUPPLY

BIDS ASKED

Bids Asked August 20

Neb., McCook—City, WW imprvs. incl. elevated steel tank and tower, pumphouse, steel pump, tower above pumphouse, standby engine, **$169,065.** Henningson Eng. Co., Standard Oil Bldg., Omaha, engr. CD 7/26—ENR 8/5.

Bids Asked August 23

Okla., Pauls Valley — City, wells, pump. equip., watermain extens., addnl. standpipe storage. **$350,000.** C. E. Bretz, Commerce Exchange Bldg., Oklahoma City, engr. CD 4/10/47.

Bids Asked August 24

N. C., Forest City — Town, G. B. Harrill, mayor, WW., raw water supply, 2 m.g.d. filtration plant, 3.3 mi. 12 in. c.i. mains, 200,000 gal. elevated steel tank. Plans deposit $15. Harwood Beebe Co., 208 Montgomery Bldg., Spartanburg, engr. CD 6/18—ENR 6/24.

Bids Asked August 25

Calif., Oakland—East Bay Municipal Utility Dist., 512 16 St., concrete foundations and anchors, pipeline for Unit C, 2nd Mokelumne Aqueduct, Spec. 81, Over $50,000. Plans deposit $5. John Longwell, ch. engr. CD 12/15/43—ENR 12/20/43.

Bids Asked August 26

Ia., Norwalk — City, pump house, pumping equip., well, elevated tank and tower, distr. sys., etc. **$35,000.** R. W. Gearhart, Cedar Rapids, engr.

Bids Asked August 27

●**Okla., Tulsa** — City, addnl. concrete pipe flow line from Pavinaw to Mohawk Lake, 28 mi. 72 in. and 24½ mi. 66 in. pipe. Approx. $5,000,000. Plans deposit $40. W. R. Holway, 302 E. 18 St., engr. CD 2/3—ENR 2/19.

Bids Asked September 2

Ga., Eatonton—City, water and sewer imprvs. Harwood Beebe Co., Montgomery Bldg., Spartanburg, S. C., engr. CD 6/25/47.

Bids Asked

Tex., Sugarland — Ralph H. Wallace, 5614 Telephone Rd., Houston, WW sys. primarily for irrigation purposes. **$35,000.**

SOON LETS CONTRACT

Tex., Dallas—Industrial Properties, Corp., c/o L. S. Stemmons, vice pres., Republic Bank Bldg., soon lets contract c.i. waterlines, 4 and 5 installments Trinity Industrial area. $45,000.

LOW BIDDERS

Ga., LaGrange—City, rejected bids Aug. 3 WW imprvs. L.B. over **$100,000.** CD 6/26—ENR 7/1.

Kan., Horton — City, imprv. Mission Lake Spillway, from R. G. Aldridge, 1610 Nebraska St., Kansas City, Kan., **$37,450.** CD 11/21/45—ENR 12/13/45.

N. C., Charlotte—City, Aug. 2. Catawba River Pump Station addns., from Blythe Bros. Co., 2911 Hutchison Ave., **$245,990.** CD 7/21—ENR 7/29.

Ore., Medford — City, City Hall, concrete pipe for South Medford and Camp White lines, from Medford Concrete Constr. Co., 1320 N. Riverdale St., **(1) $159,179 (2) $140,077.** Harvey & Watkins, Goldy Bldg., engr.

Tex., Anson — City, July 27, WW extens., from Wilks, Dake & Steed, Tyler, **$35,523.** CD 7/2—ENR 7/8.

Tex., Rusk — City, July 28, water treatment plant and lift station and concrete reservoir, from Jack Apple, Henderson, **$43,000** and **$35,000** respectively. CD 7/20.

CONTRACTS AWARDED

†**Ark., Little Rock**—U. S. Eng., Govt. Aircraft Plant 3, 2,000 N. Memorial Ave., Tulsa, Okla., repairing water lines, Maumelle Ordnance Wks., Inv. Eng-34-066-48-60, to Fourt Constr. Co., Little Rock, **$36,000.** Bids 6/22. CD 6/16.

Ga., Stockbridge—City, WW imprvs. to E. N. Murray, Buena Vista, **$49,880.** Bids 7/23. CD 7/9—ENR 7/15.

Kan., Sublette — City, exten. watermains, well, incl. imprv. present mains, etc., to Burt & Binford, 507 W. 2 St., Hutchinson, **$50,000.**

Ky., Benton—State Dpt. Parks, Frankfort, WW imprvs. at Kentucky Lake State Park, to La Grange Constr. Co., La Grange, **$40,962.** Awarded 7/30.

Mo., Cardwell—City, J. Steinberg, mayor, well and pump house, distr. sys. using asbestos pipe, to Weldon Well Co., Cape Girardeau, **$70,153.** Bids 7/7. CD 7/15—ENR 7/22, under LB.

N. C., Statesville—City, Sects. 6 and 6A, water purification plant, Sect. 9, reservoir, Sect. 10, 4th Creek Pump. Station, Sect. 11, water distr. lines, Sect. 12, raw water supply lines, to Gilbert Eng. Co., Statesville, **$668,652.** Bids 4/20. CD 4/26, under LB.

Okla., Atoka — City, addnl. wells, watermain extens., to Lippert Bros. Co., 2800 N. Santa Fe Ave., Oklahoma City, **$69,690.** Est. $75,000. V. V. Long & Co., Colcord Bldg., Oklahoma City, engrs.

Va., Cambria—Town, WW sys., to Aaron J. Conner, Route 2, Box 54, Roanoke **$120,679.** Bids 7/8. CD 7/1.

B. C., Parksville—Village, WW sys., development of spring, settling tank, pump well and storage tank, 39,000 ft. steel water pipe, to G. W. Ledingham & Co. Ltd., 1025 W. 77 Ave., Vancouver, Approx. **$30,000.** Bids 7/25. F. C. Stewart, 207 W. Hastings St., Vancouver, engr.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Bids Asked August 16

Conn., Rockville—City Clk., 15 Talcott Ave., sanitary sewer main, Highland Ave. CD 2/13/46—ENR 3/14/46.

Bids Asked August 18

Ind., Mishawaka—Bd. P. Wks., Oscar Van De Putte, secy., City Hall, Spring St. Trunk Sewer and 2 storm relief interceptors. $450,000. Plans deposit $20. Chas. W. Cole & Son, 220 W. La Salle Ave., South Bend, consult. engrs. F. J. Miller, Mishawaka, city engr. CD 6/2—ENR 6/17.

Bids Asked August 23

Mo., Tipton—City, J. J. Brant, mayor, City Hall, 5,353 ft. 6 and 8 in. v.c. sewers, 1,031 ft. 6 and 8 c.i. pipe, 20 manholes, etc., sewage lift station, pumps, etc. Contr. I; water distr. sys. extens., mains, valves, hydrants, etc. Contr. II, water well, pump and pump house Contr. III, Plans deposit $15. Frank Beard, Kahoka, Mo., engr.

Bids Asked August 24

Minn., St. Anthony (P. O. Minneapolis)—Village, School House, 33 Ave. and Silver Lake Rd., 17,803 lin. ft. 9- to 12-in. vitr. clay sewers, 63 manholes, 3,000 sq. yd. black top street replacement. $50,000. Plans deposit $5. MacGregor & Davis, 1108 Nicollet Ave., Minneapolis, engrs.

Va., Arlington—At office A. T. Lundberg, mgr., Arlington Co., Courthouse, furnishing, installing equip. for and constructing refuse incinerating plant. Extended date. Alexander Potter Assoc., 50 Church St., New York, N. Y., consult. engrs. CD 6/15—ENR 6/17.

Bids Asked September 8

Fla., Orlando—City, sanitary sewerage imprvs. Over $100,000. Plans deposit $20. Smith & Gillespie, P.O. Box 1048, Jacksonville, engrs. CD 2/4—ENR 2/19.

SOON LETS CONTRACT

Tex., Dallas—Industrial Properties Corp., c/o L. S. Stemmons, vice pres., Republic Bank Bldg., soon lets contract, sanitary sewers, 4th and 5th installments in Trinity Industrial area. $75,000.

LOW BIDDERS

Calif., Oakland—East Bay Municipal Utility Dist., 512 16 St., **July 28,** 7,450 ft. 48- to 63-in. concrete pipe, South Intercepting Sewer, Sect. 2A, Spec. SD-26, from McGuire & Hester, 796 66 Ave., **$243,808;** 48- to 63-in. rein.-con. pipe for large intercepting sewers, Spec. SD 25, from American Pipe & Constr. Co., 1630 Webster St., **$92,745.** CD 7/22—ENR.

Fla., Bradenton—City, July 23, sanitary sewer imprvs., from Higgins Inc., Sarasota, **$265,367.** CD 7/8—ENR 7/15.

Md., Towson — Comrs. of Baltimore Co., Court House, July 28, sewers and water lines, 12th Elec. Dist., Contr. 136 S. & W., from Matricciani Constr. Co., 2295 Exeter St., Baltimore, **$64,572.** CD 7/19—ENR 7/22.

Minn., Aurora—Village, A. Smolich, recdr., rejected bids July 6, sewers and sewage treatment plant. L.B. **$49,998.** CD 6/29—ENR 7/1.

N. M., Albuquerque—City, City Hall, July 20, sewage disposal plant exten., incl. sludge hopper, clarifiers, filters, etc., from Clarence W. Via, 727 Las Alamos **$201,000.** Est. $150,000. CD 7/6—ENR 7/8.

North Dakota—State Hy. Dpt., Bismarck, rejected bids July 30, storm sewer and incidental 0.651 mi. U. S. Hy. 81, Grafton, Proj. P-293, (8), Walsh Co., L.B. **$132,470.** CD 7/15—ENR 7/22.

Tex., Corpus Christi—City, July 29, 6 storm sewers, from Heldenfels Bros., 521 McBride lane, **$54,841***** storm sewer, Water St., from T. H. Lee, c/o Bryant Bldg., **$265,743***** storm sewer, Culberson St., from Lee Akin, Corpus Christi, **$88,460.** R. L. Otto, city engr. CD 7/14.

Tex., Rusk—City, July 28, sewerage sys., sewage treatment plant, from Jack Apple, Henderson, **$72,000.** CD 7/20.

CONTRACTS AWARDED

Colo., Fort Collins—City, storm sewers in 14 block area, to Birchby and Nauman Inc., 1750 Jasmine Ave., Denver, **$75,168.** Bids 7/26. CD 10/17/46—ENR 10/31/46.

Ind., Rushville—Bd. P. Wks., Rushville, sewers, to M. A. Hernley, Parker, **$94,000;** mechanical equip. for sewage treatment plant, to Superior Plumbing & Heating Co., Janney Ave., Muncie, **$175,000.** Bids 7/20. Awarded 7/28. CD 7/9—ENR 7/15.

Ia., Ames—City, J. W. Prather, aud. and clk., and Iowa State College, Ames, sewage disposal plant and auxiliaries, etc., from Weldon Bros., 1711 W. Washington St., Iowa Falls, **$886,484;** electrical work, from Keith Electrical Constr. Co., 1213 Walnut St., Des Moines, **$54,946.** CD 12/1—ENR 12/11.

N. Y., New York—Bd. Water Supply, 120 Wall St., Zone 5, Contr. 396, Grahamsville sewerage sys., town of Neversink, Sullivan Co., to DiMarco & Ciccone, Inc., 151 E. Post Rd., White Plains, **$743,215.** Bids 7/16. CD 7/22—ENR 7/29, under LB.

S. C., Gaffney—City, sewage disposal plant, to G. E. Moore Co., Greenwood, **$82,760.** Bids 7/29. CD 7/23.

Tex., Houston — River Oaks Corp., River Oaks Blvd., storm sewer extens. to Buffalo Bayou, own forces. **$55,000.**

BRIDGES

BIDS ASKED

Bids Asked August 19

†**Mississippi** — Pub. Roads Admin., Medical Arts Bldg., Florence, Ala., Natchez Trace Parkway, Choctaw Co. Props. 3J4, 3J5, 3J6, Bridge.

Bids Asked August 25

Mass., Fitchburg—Joseph M. Peirce, comr. P. Wks., City Hall, altering, repairing 5 St. Viaduct, Plans deposit $50. CD 9/6/45—ENR 9/13/45.

Bids Asked On or About September 8

†**Ohio**—U. S. Eng., Madison Ave. and 8 St. West Huntington 18, W. Va., abutments, wing walls for two bridges, in connection with re-

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterworks $28,000; other public works $50,000; industrial buildings $68,000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings

Unclassified

Stages Reported

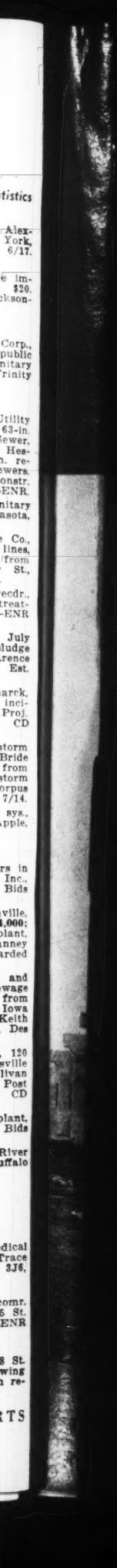
PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.;

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
● Project of $1,000,000 or over.
ENR Engineering News-Record
CD Engineering News-Record Construction Daily